



UNIVERSITY OF MONTANA BULLETIN

College of Agriculture and Mechanic Arts Series

No. 14.

COLLEGE OF AGRICULTURE AND MECHANIC ARTS

Colleges of Agriculture, Engineering,
Applied Science, Household and Industrial Arts,
Courses in Vocational Education,
Secondary Schools of Agriculture,
Home Economics, Mechanic Arts.

TWENTY-SIXTH ANNUAL CATALOGUE

1918-1919

ANNOUNCEMENTS FOR

1919 - 1920

BOZEMAN, MONTANA
MAY, 1919

Entered at Bozeman, Montana, as Second Class Matter Under Act of Congress
August 24, 1912.

THE UNIVERSITY OF MONTANA

EDWARD C. ELLIOTT, Chancellor of the University.

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, Approved March 14, 1913, (effective July 1, 1913).

The general control and supervision of the University are vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

Montana State Board of Education

S. V. STEWART, Governor.....	Ex-officio, President
S. C. FORD, Attorney General.....	Ex-officio
MAY TRUMPER, Supt. of Public Instruction.....	Ex-officio, Secretary
C. E. K. VIDAL.....(1920)	J. BRUCE KREMER.....(1922)
W. S. HARTMAN.....(1920)	C. H. HALL.....(1922)
JOHN DIETRICH.....(1921)	LEO H. FAUST.....(1923)
A. LOUIS STONE.....(1921)	W. H. NYE.....(1923)

The University comprises the following institutions, schools and departments:

The State University, Missoula

Established February 17, 1893, and consisting of

The College of Arts and Sciences	The School of Education
The School of Law	The School of Business Administration
The School of Pharmacy	The Summer Quarter
The School of Forestry	The Biological Station
The School of Journalism	(Flathead Lake)
The School of Music	The Public Service Division
	The Graduate Division.

EDWARD O. SISSON, President.

The State College of Agriculture and Mechanic Arts, Bozeman

Established February 16, 1893, and consisting of

The College of Agriculture	The Summer Quarter
The College of Engineering	The Secondary Schools
The College of Applied Science	Home Economics
The College of Household and Industrial Arts	Mechanic Arts
Courses for Vocational Teachers	Agriculture
The School of Music	The Agricultural Experiment Station
	The Agricultural Extension Service

JAMES M. HAMILTON, President.

The State School of Mines, Butte

Established February 17, 1893.

CHARLES H. BOWMAN, President.

The State Normal College, Dillon

Established February 23, 1893, and consisting of

The Teachers' Certificate Course	The Four-years Course
The Three-years Course	The Rural Teachers' Course
	The Courses for Supervisors

JOSEPH E. MONROE, President.

For publications and detailed information concerning the different schools and colleges address the President of the particular institution concerned. Communications intended for the Chancellor of the University should be addressed to the State Capitol, Helena, Montana.

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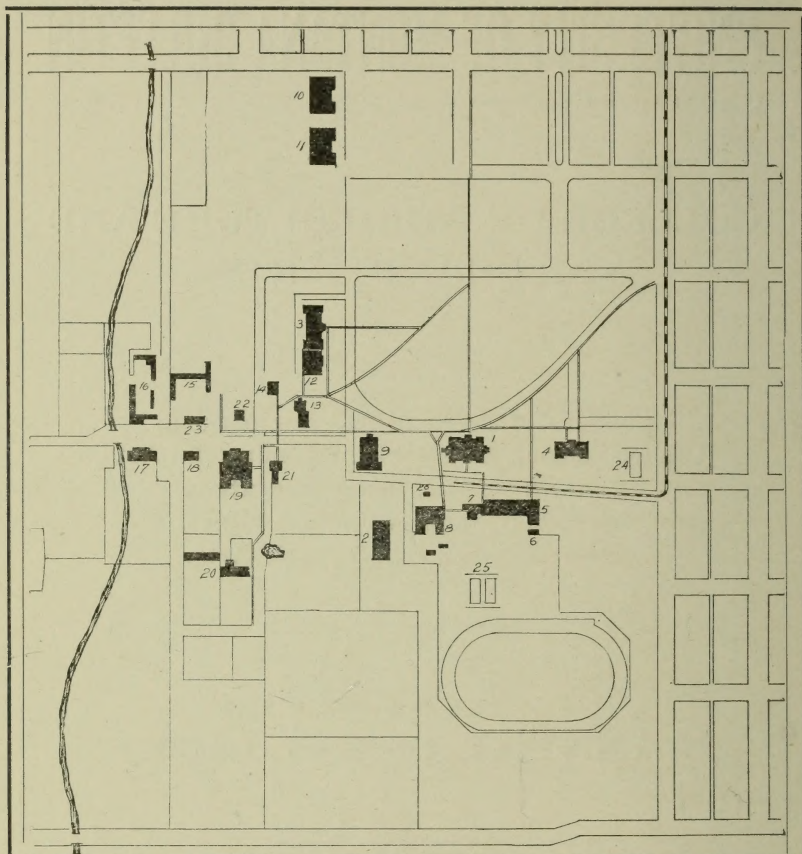
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- | | |
|-----------------------------|---------------------------|
| 1—Montana Hall | 14—Grain Laboratory |
| 2—Chemistry Building | 15—Implement Sheds |
| 3—Agricultural Hall | 16—Sheep Barn and Piggery |
| 4—Hamilton Hall | 17—Feeding Barn |
| 5—Engineering Laboratory | 18—Granary |
| 6—Cement Laboratory | 19—Cattle Barn |
| 7—Heating Plant | 20—Poultry House |
| 8—Shops | 21—Veterinary Building |
| 9—Gymnasium and Drill Hall | 22—Club House |
| 10—Barracks | 23—Horse Barn |
| 11—Men's Dormitory | 24—Tennis Court for Women |
| 12—Horticultural Greenhouse | 25—Tennis Courts |
| 13—Biology Building | |

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1921/22

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1919

JULY

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Calendar.

1919-1920

1919

Spring Quarter

Mar. 29, Saturday	Registration Day
Mar. 31, Monday	Instruction begins
May 9, Friday	Standing of Students Reported
May 30, Friday	Memorial Day, a Holiday*
June 15, Sunday	Baccalaureate Address
June 18, Wednesday	Commencement
June 18-20, Wednesday-Friday	Examinations

Summer Quarter

June 23, Monday	First Term begins
July 4, Friday	Independence Day, a Holiday*
Aug. 1, Friday	First Term ends
Aug. 4, Monday	Second Term begins
Sept. 5, Friday	Second Term ends

Autumn Quarter

Sept. 27, 28, Friday, Saturday	Registration Days
Sept. 29, Monday	Instruction begins
Oct. 12, Sunday	Columbus Day*
Nov. 27, Thursday	Thanksgiving Day, a Holiday*
Dec. 17-19, Wednesday-Friday	Examinations
Dec. 19, Friday, 4:30 p. m.	First Quarter ends, Christmas Recess begins

1920

Winter Quarter

Jan. 3, Saturday	Registration of New Students
Jan. 5, Monday	Christmas Recess ends, Instruction begins
Feb. 12, Thursday	Lincoln's Birthday*
Feb. 13, Friday	Standing of Students Reported
Feb. 16, Monday	Founders' Day
Feb. 22, Sunday	Washington's Birthday*
Mar. 10-13, Wednesday-Saturday	Interscholastic Basketball Tourna- ment
Mar. 24-26, Wednesday-Friday	Examinations

Spring Quarter

Mar. 27, Saturday	Registration Day
Mar. 29, Monday	Instruction begins
May 7, Friday	Standing of Students Reported
May 30, Sunday	Memorial Day, a Holiday*
June 13, Sunday	Baccalaureate Address
June 16, Wednesday	Commencement
June 16-18, Wednesday-Friday	Examinations

Summer Quarter

June 21, Monday	First Term begins
July 4, Sunday	Independence Day, a Holiday*
July 30, Friday	First Term ends
Aug. 2, Monday	Second Term begins
Sept. 3, Friday	Second Term ends

Autumn Quarter

Sept. 28, 29, Tuesday, Wednesday	Registration Days
Sept. 30, Thursday	Instruction begins
Oct. 12, Tuesday	Columbus Day*
Nov. 6, Friday	Standing of Students Reported
Nov. 25, Thursday	Thanksgiving Day, a Holiday*
Dec. 20-22, Monday, Wednesday	Examinations
Dec. 22, Wednesday, 4:30 p. m.	Quarter ends, Christmas Recess begins

*No days are holidays unless specially designated in the calendar.

Official Directory

EXECUTIVE BOARD

JAMES M. HAMILTON (ex-officio), Chairman.....	Bozeman
J. H. BAKER (term expires April 1919),.....	Bozeman
W. S. DAVIDSON (term expires April 1921),.....	Bozeman
ALLEN CAMERON, Secretary-Treasurer.....	Bozeman

ADMINISTRATIVE OFFICERS

EDWARD C. ELLIOTT, Ph. D.....	Chancellor, University of Montana
JAMES M. HAMILTON, M. S.....	President
FREDERICK B. LINFIELD, B. S. A.....	Director, Experiment Station
FRED S. COOLEY, B. S.....	Director, Extension Service
UNA B. HERRICK.....	Dean of Women
JOHN H. HOLST, M. A.....	Principal Secondary Schools and Director Summer Session.
ROY ORVIS WILSON, B. S.....	Registrar
MARTHA I. JOHNSON, B. S.....	House Director at Hamilton Hall
JOHN C. PARK.....	Superintendent of Buildings

THE FACULTY

Professors.

ABBEY, MYRON J.....	Professor of Agricultural Education A. B., Brown University, 1902.
ARNETT, CLARE NEWTON.....	Professor of Animal Husbandry B. S. A., Purdue University, 1907.
ATKINSON, ALFRED.....	Professor of Agronomy B. S., Iowa State College, 1904; M. S. Cornell University, 1912.
BALES, ALBA.....	Professor of Home Economics B. S., Columbia University, 1917.
BENNION, FRED.....	Physical and Athletic Director A. B., University of Utah, 1907.
*BREWER, WILLIAM F.....	Professor of English A. B., Grinnell College, 1891; A. M., 1897; A. M. Harvard University, 1899.
COBLEIGH, WILLIAM M.....	Professor of Chemistry A. M., Columbia University, 1899.

*On leave of absence—Y. M. C. A. War Work.

- CONKLING, LEON D.....Professor of Civil Engineering
C. E., Cornell University, 1900.
- COOLEY, ROBERT A.....Professor of Entomology and Zoology
B. S., Massachusetts Agricultural College, 1895.
- CURRIER, AARON H.
Director School of Music and Professor of Vocal Music.
A. B., Oberlin College, 1892; A. M., 1894.
- FORREST, ELIZABETH.....Librarian
B. L. S., University of Illinois, 1906; A. M., University of Chicago, 1917.
- HAM, FRANK.....Professor of Physics
B. S., Montana State College, 1903; M. S., 1905.
- HAMILTON, JAMES M.
President and Professor of Economics and Sociology
B. S., Union Christian College, 1887; M. S., 1890.
- HEATH, C. O.....Professor of Military Science and Tactics
Captain, U. S. Army.
- HERRICK, UNA B.
Dean of Women and Director of Physical Education for Women
- HOLST, JOHN H.
Principal of Secondary Schools, Director of the Summer Session,
and Assistant Professor of English
A. M., University of Montana, 1918.
- LINFIELD, FREDERICK B.....Dean of Agriculture
B. S. A., Ontario Agricultural College, 1891.
- MARTIN, GEORGE LESTER.....Professor of Dairy Husbandry
B. S., Iowa State College, 1908.
- NASH, W. GIFFORD.....Professor of Piano Music
- PLEW, WILLIAM R.....Professor of Architectural and Civil Engineering
B. S., Rose Polytechnic Institute, 1907; M. S., 1910.
- RICHTER, ARTHUR W.
Dean of Engineering and Professor of Mechanical Engineering
B. M. E., University of Wisconsin, 1889; M. E., 1891; M. M. E., Cornell
University, 1899.
- SCHOPPE, WILLIAM F.....Professor of Poultry Husbandry
B. S., University of Maine, 1907; M. S., 1913.
- SWINGLE, DEANE B.....Professor of Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wis-
consin, 1901.
- TALLMAN, WILLIAM D.....Professor of Mathematics
B. S., University of Wisconsin, 1896.
- THALER, JOSEPH A.....Professor of Electrical Engineering
E. E., University of Minnesota, 1900.

- WELCH, HOWARD.....Professor of Veterinary Science
A. B., University of Missouri, 1902; B. S. A., 1906; D. V. M., Cornell University, 1909.
- WHIPPLE, ORVILLE B.....Professor of Horticulture
B. S., Kansas State Agricultural College, 1904.
- WILSON, ROY ORVIS.....Professor of Secretarial Studies and Registrar
B. S., South Dakota State College, 1911.

Assistant Professors

- *BALDWIN, LANA A.....Assistant Professor of Art
- BREWER, HELEN R.....Assistant Professor of History
A. B., Grinnell College, 1888.
- CHALLENGER, RALPH T.....Assistant Professor in Trades and Industry
B. S., Kansas State Agricultural College, 1908; M. S., 1918.
- CURRIER, EDWIN L.....Assistant Professor of Farm Management
B. S., University of Nebraska, 1912.
- DUDDY, EDWARD A.....Assistant Professor of English
A. B., Bowdoin College, 1907; A. M., Harvard University, 1908.
- EDWARDS, MORGAN J.....Assistant Professor of Secretarial Studies
A. B., Ripon College, 1910.
- FORD, CARLOTTA MARKS.....Assistant Professor of Home Economics
A. B., University of Illinois, 1911.
- FRANKS, EDITH.....Assistant Professor of Home Economics
- GIESEKER, LEONARD F.....Assistant Professor of Agronomy
B. S., University of Nebraska, 1908; M. S., Cornell University, 1914.
- JENNISON, HARRY M.....Assistant Professor of Botany and Bacteriology
B. S., Massachusetts Agricultural College, 1908; M. A., Wabash College, 1911.
- JOSEPH, W. E.....Assistant Professor of Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.
- MURDOCK, HARVEY E.....Assistant Professor of Farm Mechanics
B. S., University of Colorado, 1906; M. E., 1908; C. E., University of Illinois, 1911.
- MCCHORD, R. C.....Assistant Professor of Animal Husbandry
A. B., Central University, 1908; B. S. A., Iowa State College, 1913.
- QUINN, E. J.....Assistant Professor of Chemistry
B. S., Notre Dame University, 1911.
- SNOW, FRANK C.....Assistant Professor of Civil Engineering
C. E., Ohio State University, 1906.
- SPAULDING, MILO H.....Assistant Professor of Zoology
A. B., Leland Stanford Junior University, 1903; A. M., 1906.

*On leave of absence.

- STARRING, CECIL C.....Assistant Professor of Horticulture
B. S., South Dakota State College, 1911.
- SUMNER, HARLAN R.....Assistant Professor of Agronomy
B. S. A., Kansas State Agricultural College, 1916; M. A., University of
Missouri, 1917.
- THIERKELSEN, ERIC
Assistant Professor of Electrical and Mechanical Engineering
B. S., University of Washington, 1911; M. S., 1913.
- VAN STEENBERG, CECILE.....Assistant Professor of Home Economics
Ph. B. University of Chicago, 1913.
- *WHITCOMB, WILLIAM O.....Assistant Professor of Agronomy
B. S. A., North Dakota Agricultural College, 1909; M. S. A., Cornell Uni-
versity, 1913.
- WALLIN, FLORENCE.....Assistant Professor of French and Spanish
A. B., State University of Iowa, 1907.

Instructors

- BERRY, MILDRED.....Instructor in Art
- BRENNEMAN, ANNIE T.....Instructor in Mathematics and Physics
B. S., Montana State College, 1907.
- BULL, FRIEDA M.....Instructor in Mathematics
B. S., Montana State College, 1907; M. S., 1909.
- DONALDSON, JESSIE.....Instructor in English
A. B., University of Minnesota, 1913.
- **HARTMAN, JUNE.....Instructor in Piano Music
B. S., Montana State College, 1910.
- HOMANN, FREDERICK C.....Instructor in Mechanical Engineering
B. S., Montana State College, 1916.
- HOWARD, LOUIS L.....Instructor in Band Music
- HYTREE, EDWARD C.....Instructor in Chemistry
B. S., Ohio Wesleyan University, 1912; A. M., Ohio University, 1914.
- JACKSON, FRED O.....Instructor in Violin and Orchestra
- JONES, THEDA M.....Instructor in Stenography and Typewriting
- JORDAN, VICTORIA.....Instructor in Home Economics
B. S., Purdue University, 1915.
- KATELEY, FRED.....Instructor in Forge and Foundry
- KIEFER, JAMES A.....Instructor in Physics
B. S., Montana State College, 1914.
- MAXWELL, LORA.....Instructor in Physical Education
B. Pd., Montana State Normal College, 1911.

*Resigned December 1, 1918.

**On leave of absence—Y. M. C. A. War Work in France.

MOORE, MURIEL.....	Instructor in Art
PARK, JOHN C.....	Instructor in Mechanical Engineering
*SLOAN, ROYAL D.....	Instructor in Electrical Engineering
B. S., Montana State University, 1913.	
TRETSVEN, OSCAR.....	Instructor in Animal Husbandry

Assistants

RITZ, GLADYS.....	Assistant in Chemistry
B. S., University of Montana, 1918.	
SNOW, MANFRED L.....	Assistant in Agronomy
B. S., Montana State College, 1917.	

EXPERIMENT STATION STAFF

LINFIELD, FREDERICK B.....	Director
B. S. A., Ontario Agricultural College, 1891.	

Department Heads

ARNETT, CLARE NEWTON.....	Animal Husbandry
B. S. A., Purdue University, 1907.	
ATKINSON, ALFRED.....	Agronomy
B. S., Iowa State College, 1904; M. S., Cornell University, 1912.	
BURKE, EDMUND.....	Chemistry and Meteorology
B. S., Montana State College, 1907.	
COOLEY, ROBERT A.....	Entomology
B. S., Massachusetts Agricultural College, 1895.	
CURRIER, EDWIN L.....	Farm Management
B. S., University of Nebraska, 1912.	
**JAHNKE, EMIL W.....	Superintendent of Grain Laboratory
B. S., University of Minnesota, 1915.	
MURDOCK, HARVEY E.....	Agricultural Engineering
B. S., University of Colorado, 1906; M. E., University of Colorado, 1908; C. E., University of Colorado, 1911.	
SCHOPPE, WILLIAM F.....	Poultry
B. S., University of Maine, 1907; M. S., University of Maine, 1913.	
SWINGLE, DEANE B.....	Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.	
WELCH, HOWARD.....	Veterinary
A. B., University of Missouri, 1902; B. S. A., University of Missouri, 1906; D. V. M., Cornell University, 1909.	

*On leave of absence—U. S. Army.

**Deceased.

WHIPPLE, ORVILLE B.....Horticulture
B. S., Kansas State Agricultural College, 1904.

Department Assistants

BLISH, MORRIS J.....Chemistry
B. S., University of Nebraska, 1912; A. M., University of Nebraska, 1913;
Ph. D., University of Minnesota, 1915.

GIESEKER, LEONARD F.....Agronomy
B. S., University of Nebraska, 1908; M. S. A., Cornell University, 1914.

*HANSEN, CHARLES L. Agronomy
B. S., Montana State College, 1914.

**JONES, RAY S. Chemistry
B. S., Montana State College, 1915.

JOSEPH, W. E.....Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.

***MORRIS, ERNEST Agronomy

MORRIS, H. E.....Botany and Bacteriology
B. S., Montana State College, 1909; M. S., University of Wisconsin, 1917.

NELSON, JOSEPH B.....Agronomy

PARKER, JOHN R.....Entomology
B. S., Massachusetts Agricultural College, 1908.

PINCKNEY, REUBEN M.....Chemistry
B. S., Nebraska Wesleyan University, 1906; A. M., University of Nebraska,
1908.

STARRING, CECIL C.....Horticulture
B. S., South Dakota State College, 1911.

STEWART, MILDRED V.....Chemistry
B. S., University of Wisconsin, 1918.

TRETSEVEN, OSCAR.....Animal Husbandry

WOOD, DILLER C.....Farm Management
B. S., University of Missouri, 1915.

SUBSTATION STAFF

Judith Basin Substation, Moccasin

CARDON, P. V.....Superintendent
B. S., Utah Agricultural College, 1909.

North Montana Substation, Havre

MORGAN, GEORGE.....Superintendent
B. S., Montana State College, 1912.

*Deceased.

**On leave of absence—U. S. Army.

***On leave of absence—Hospital Corps.

WOODWARD, NORVAL F.....Assistant
B. S., Washington State College, 1912.

Huntley Substation, Huntley

HANSEN, DAN.....Superintendent

SEAMANS, ARTHUR.....Assistant
B. S., Montana State College, 1913.

Horticultural Substation, Corvallis

THORNBERRY, HARVEY.....Superintendent
B. S., Washington State College, 1911.

AGRICULTURAL EXTENSION STAFF

COOLEY, FRED S.....Director
B. S., Massachusetts Agricultural College, 1888.

ABBEY, M. J.
State Leader Boys' and Girls' Clubs and Professor of Agricultural
Education
A. B., Brown University, 1902.

BEERS, WAYLAND L.....State Leader of Market Specialists
B. S., Brown University, 1895.

BENNION, FRED.....Assistant State Leader of County Agents
A. B., University of Utah, 1907.

CAMPBELL, MRS. CLARA BUSH
Assistant State Leader of Home Demonstration Agents
B. S., University of Minnesota, 1911.

COPELAND, A. J.....Farm Management Demonstrator
B. S., Ohio State University, 1915.

FULLER, F. E.....Field Agent in Agronomy
B. S., Kansas Agricultural College, 1911; B. S., Iowa State College, 1917.

GRABER, MARY ANN
Assistant State Leader of Home Demonstration Agents
B. S., Ohio State University, 1915.

JENNISON, HARRY M.....Extension Botanist
B. S., Massachusetts Agricultural College, 1908; M. A., Wabash College, 1911.

LOTT, ELMO HAMILTON.....Assistant State Leader of County Agents
B. S., Cornell University, 1912; B. S. A., Iowa State College, 1917.

OGILVIE, MINA.....Assistant State Leader of Boys' and Girls' Clubs
B. S., Kansas Agricultural College, 1912.

POTTER, C. E.....Assistant State Leader of Boys' and Girls' Clubs

QUAW, MIGNON M.
Assistant State Leader of Home Demonstration Agents
B. S., Montana State College, 1902; M. A., Columbia University, 1910.

- RILEY, EDWARD H.....State Leader of Live Stock Specialists
B. S. A., University of Minnesota, 1903; D. V. M., George Washington University, 1911.
- ROOSEVELT, GEORGE A.....Field Agent in Rodent Control
- ROWE, BESS M.....State Leader of Home Demonstration Agents
B. S., University of Minnesota, 1910.
- SEAMANS, HOWARD L.....Special Field Agent in Entomology
(Appointment terminated June 30, 1919)
B. S., Montana State College, 1913.
- STRAND, A. L.....Special Field Agent in Entomology
(Appointment terminated June 30, 1919)
B. S., Montana State College, 1917.
- TAYLOR, JOHN C.....Assistant State Leader of County Agents
B. S., Montana State College, 1912.
- TOMSON, W. E.....State Specialist in Dairying
B. S., Kansas Agricultural College, 1912.
- WILSON, MILBURN LINCOLN.....State Leader of County Agents
B. S. A., Iowa State College, 1907.

County Agents

- ANDERSON, A. D.....Richland County, Sidney
- ANDERSON, E. W.....Sheridan County, Plentywood
B. S. A., North Dakota Agricultural College, 1914.
- BANKER, PAUL P.....Hill County, Havre
B. S., University of Wisconsin, 1912.
- BAUMGARTEL, WALTER.....Assistant Fergus County, Lewistown
- BROICH, WALTER F.....Rosebud County, Forsyth
B. S. A., Oklahoma A. and M. College, 1913; M. S., Oregon Agricultural College, 1915.
- BROSSARD, H. S.....Yellowstone County, Billings
B. S., Utah Agricultural College, 1916.
- CAMPEELL, J. R.Missoula County, Missoula
B. S., Iowa State College, 1909; M. S., 1911.
- CLARKSON, ROBERT E.....Teton County, Fort Benton
B. S., Montana State College, 1917.
- GORDON, W. R.....Broadwater County, Townsend
B. S. A., West Virginia University, 1916.
- HAMPTON, SAMUEL.....Western Dawson County, Sumatra
- HILLMAN, FRANK M.....Sanders County, Thompson Falls
B. S., University of Minnesota, 1912.
- JONES, W. H.....Stillwater County, Columbus
B. S. A., West Virginia University, 1912.

- LEWIS, GROVER E.....Prairie County, Terry,
B. S., Utah Agricultural College, 1916.
- MACSPADDEN, F. E.....Cascade County, Great Falls
B. S., Montana State College, 1917.
- McKEE, R. B.....Flathead County, Kalispell
B. S. North Dakota Agricultural College, 1916.
- MENDENHALL, DEANE W.....Dawson County, Glendive
B. S., North Dakota Agricultural College, 1914.
- MICHEL, CHARLES A.....Toole County, Shelby
B. S., North Dakota Agricultural College, 1909; M. S., University of Wisconsin, 1912.
- MURDOCK, WALLACE S.....Teton County, Choteau
B. S., Utah Agricultural College, 1914.
- OGAARD, ARTHUR J.....County Agent at Large
B. S., North Dakota Agricultural College, 1913.
- PETERSON, CARL H.....Fergus County, Lewistown
- POLLINGER, W. E.....Missoula County, Missoula
- SCOTT, ROY S.....Musselshell County, Roundup
B. S. A., University of Illinois, 1917.
- SHELDON, VICTOR B.....Cascade County, Great Falls
B. S., Missouri Wesleyan College, 1914.
- SHINN, W. R.....Chouteau County, Fort Benton
B. S. A., University of Illinois, 1906.
- SKUSE, W. W.....Lewis and Clark County, Helena
C. E., Washington State College, 1912; B. S. A., 1915.
- SPRING, L. H.....Ravalli County, Hamilton
B. S. A., Oregon Agricultural College, 1910.
- STAPLETON, W. P.....Phillips County, Malta
B. S. A., North Dakota Agricultural College, 1913.
- STEBBINS, MURRAY E.....Valley County, Glasgow
B. S., North Dakota Agricultural College, 1913.
- THORFINSON, M. A.....Blaine County, Chinook
B. S. A., North Dakota Agricultural College, 1917.
- YERRINGTON, C. M.....Custer County, Miles City
B. S., North Dakota Agricultural College, 1914.

County Club Leaders

- KAUFMANN, H. N.....Flathead County, Kalispell

Home Demonstration Agents

BARNARD, E. MARIE.....	Yellowstone District, Miles City (Appointment terminated June 30) B. S., Kansas State Agricultural College, 1902.
BETZ, NEVIN O.....	Great Falls B. A., University of Wisconsin, 1913.
DAWSON, GLADYS.....	Blaine County, Chinook A. B., Indiana State College, 1917.
HARMON, ELLA M.....	Ravalli County, Hamilton B. S., Montana State College, 1914.
HOTT, NORA M.....	Fergus County, Lewistown B. S., Kansas State Agricultural College, 1914.
KELLEY, JEANETTE A.....	Stillwater County, Columbus B. S., Montana State College, 1917.
NEWELL, MARY.....	Fergus County, Lewistown (Red Cross Service October 1)
MCDONALD, MRS. MYRTELLE.....	Cascade County, Great Falls
OLSON, ANTOINETTE.....	Missoula County, Missoula B. S., University of Minnesota, 1914.
REYNOLDS, LUCILLE W.....	Lewis and Clark County, Helena
ROOSEVELT, GEORGIA C.....	Gallatin County, Bozeman B. S., Montana State College, 1914.
WILLIS, MINA A.....	Yellowstone County, Billings B. S., University of Wisconsin, 1913; M. S., 1914; B. S., University of Idaho, 1918.
WOOD, CHRISTINE M.....	Flathead County, Kalispell B. S., Washington State College, 1913.
YOUNG, VERNA T.....	Butte B. S., Montana State College, 1917.

SUMMER QUARTER

JOHN H. HOLST.....Director
M. A., University of Montana, 1918.

THE FACULTY

ABBEEY, M. J.....Agriculture
A. B., Brown University, 1902.

BALDWIN, LANA A.....Art

CHALLENGER, RALPH T.....Manual Training
B. S., Kansas State Agricultural College, 1908; M. S., 1918.

CURRIER, AARON H.....Vocal Music
A. M., Oberlin College, 1892; A. M., 1894.

DAVIS, IDA M.....Methods in Language and Reading
A. B., Central College.

ERICKSON, E. A.Mental Arithmetic and Methods

HAMILTON, JAMES M.....Psychology
B. S., Union Christian College, 1887; M. S., 1890.

HOLST, JOHN H.....History of Education
M. A., University of Montana, 1918.

HERRICK, UNA B.....Dean of Women

HOLLIER, MYRTLE.....Piano Music

JORDAN, VICTORIA L.....Home Economics
B. S., Purdue University, 1915.

KNOBEL, AMALIE.....Methods
Bridgewater Normal.

KETCHAM, G. A.....History and Civics
A. B., Oberlin College.

MAXWELL, LORA B.....Play and Physical Education
B. Pd., Montana State Normal College, 1911.

PEPPLE, BLANCHE.....Rural School Management
B. S., Columbia University.

WILSON, ESTALINE.....Educational Psychology
M. A., Columbia University.

.....Primary Methods

WYLIE, MARY G.....Hygiene and Sanitation and Literature
B. S., Montana State College.

SPECIAL LECTURERS

AYER, ADELAIDE M.....	Inspector of Rural Schools
CARNEY, MABEL.....	Department Rural Education, Columbia University
ELLIOTT, EDWARD C.....	Chancellor University of Montana
FOOTE, L. R.....	Deputy State Superintendent of Public Instruction
HETHERINGTON, DAISY ALFORD.....	Berkeley, California
KEMP, W. W.....	Head Department of Education, University of California
NIELSON, MINNIE J.....	State Superintendent of Schools for North Dakota
REINOEHL, CHARLES M.....	Inspector of Rural Schools
SISSON, E. O.....	President Montana State University
SMITH, F. O.....	Head of Department of Psychology, Missoula
TRUMPER, MAY.....	State Superintendent of Public Instruction

FACULTY COMMITTEES

ABSENCE:

Atkinson, Mrs. Herrick, Conkling.

ATHLETICS:

Swingle, Bennicn, Duddy.

BUILDINGS AND GROUNDS:

Linfield, Park, Whipple.

ELIGIBILITY OF ATHLETICS:

Hamilton, Schoppe, Quinn.

GRADUATE STUDIES:

Cooley, Thaler, Atkinson.

INSTRUCTION:

Cobleigh, Miss Bales, Holst.

INTERSCHOLASTIC:

Bennion, Duddy, Jennison, Tallman, Plew.

LIBRARY:

Atkinson, Richter, Miss Ford, Cooley, Miss Brewer.

MILITARY CREDIT AND ADVANCED STANDING:

Conkling, Swingle, Holst, Schoppe.

NEW COURSES:

Ham, Tallman, Plew.

PUBLICATIONS:

Brewer, Wilson, Whipple.

PUBLIC EXERCISES:

Hamilton, A. H. Currier, Mrs. Herrick.

RECOMMENDATIONS FOR POSITIONS:

Wilson, Miss Bales, Burke.

REGISTRATION:

Ham, Miss Brewer, Duddy.

SCHEDULE:

Tallman, Edwards, Arnett, Snow.

SCHOLARSHIP:

Ham, Martin, Miss Franks.

STATE FAIR:

Plew, Parker, Miss Baldwin, Fuller, Wilson.

STUDENT AFFAIRS:

Miss Brewer, Spaulding, Mrs. Herrick, McChord, Wilson.

STUDENT LOANS:

Richter, Linfield, Mrs. Herrick.

SUMMER SESSION:

Holst, Conkling, Cobleigh, Arnett, Miss Bales.

University of Montana

HISTORICAL SKETCH

An Act of Congress approved February 18, 1881, dedicated for university purposes in Montana, seventy-two sections of the public domain. The Enabling Act, providing for the organization of the State of Montana and its admission to the Union, February 22, 1889, confirmed this grant to the State and added one-hundred thousand acres for a school of mines, one-hundred thousand acres for normal schools, and one hundred and forty thousand acres for an agricultural college.

The Third Legislative Assembly of the State of Montana, in February, 1893, enacted laws providing for the establishment of all these institutions, and locating the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon, and the State Agricultural College at Bozeman.

As the lands granted for higher educational purposes, together with timber or stone thereon, have been sold, the proceeds have gone into permanent funds invested for the various institutions, and the interest on these funds, together with the rentals of unsold lands, has been used for the support of the respective institutions. These maintenance resources have been supplemented with appropriations made each subsequent biennium by the Legislative Assembly, which has also provided for the erection of buildings at the expense of the State.

These institutions were administered independently by local executive boards for some years under the general supervision of the State Board of Education; by a law of 1909 the powers of the local boards were more closely defined and the direction of the State Board of Education made more effective. By the enactment of Chapter 92 of the Laws of the Thirteenth Legislative Assembly in 1913 the four institutions were combined into the University of Montana under the executive control of an officer whose title is Chancellor. In October, 1915, the State Board of Education appointed Edward C. Elliott, then of the University of Wisconsin, as the first Chancellor of the University of Montana. He assumed his duties February 1, 1916.

College of Agriculture and Mechanic Arts

HISTORICAL SKETCH

By an Act of the Third Legislative Assembly of Montana, February 16, 1893, signed by Governor J. E. Rickards, the Agricultural College of the State of Montana was located at Bozeman. This Act provided for an Executive Board which should have the immediate control and direction of the affairs of the College, subject only to the general supervision of the State Board of Education. The Executive Board was authorized to appoint a secretary and treasurer and to choose a president and faculty.

On March 21, 1893, the State Board of Education held its first meeting at Bozeman. A site of forty acres for campus was donated by Nelson Story, Sr. An adjoining one-hundred and sixty acres of land, owned by Gallatin county, was donated, one-half by the county and one-half by the citizens of Bozeman. An executive Board was appointed. The Executive Board chose Luther Foster for Acting President. On April 17, with the President and an assistant, instruction was begun. September 15, the College opened for its first full year's work. A. M. Ryon was president and the faculty numbered six. Courses were offered in agriculture, domestic economy, and applied science, the last being chiefly engineering and chemistry. There was also established a one-year preparatory course, a two-years business course, modeled after the usual private business college, and a music department.

Nelson Story, Sr., donated the use of a frame building which had been occupied as a Presbyterian Academy. The public school board allowed the use of some rooms in a nearby school building. During the summer of 1894 the brick veneer building now used for biology was erected out of the Hatch Experiment Station Fund.

The Legislative Assembly in 1895 authorized a bond issue of \$100,000.00 to provide funds to erect and furnish buildings for the college.

By the enactment of Chapter 92 of the laws of the Thirteenth Legislative Assembly in 1913, the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon and the State Agricultural College at Bozeman were combined into the University of Montana, under the executive control of an officer whose title is Chancellor.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Section 16, grants ninety

thousand acres of land to Montana for the use and support of an agricultural college according to the terms of the Act of Congress, July 2, 1862, and Section 17 grants an additional fifty thousand for the same purpose and subject to the same conditions and limitations as the other grant. The one hundred and forty thousand acres of land cannot be sold for a price less than ten dollars per acre and the principal, together with all money received from the sale of timber, is to be invested as a permanent endowment. The unsold land may be leased, and the rental, together with the interest on the permanent endowment, shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriates twenty-five thousand dollars annually out of the treasury of the United States. By the Nelson Bill passed March 3, 1907, this amount was increased annually by five thousand dollars each year beginning in 1907 until now the total annual appropriation has reached fifty thousand dollars, at which figure it is to remain.

The Smith-Hughes Act of Congress, February, 1917, provides a plan for Vocational Education in Agriculture, Home Economics and the Trades and Industry. The training of teachers under the federal plan for Vocational Education as authorized by the Smith-Hughes Act is the work of the College. The federal government makes an annual appropriation of \$5,000.00 and the State Legislature a like amount.

PURPOSE AND SCOPE.

The purpose of the colleges of agriculture and mechanic arts is chiefly to provide collegiate education in agriculture, engineering, home economics, and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in an act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for the

further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture and mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893, accepts these grants of lands and money and provides that the Montana State College shall have for its object "Instruction and education in the English language, literature and mathematics, civil and mechanical engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed by the State Board of Education; political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

THE COLLEGE CAMPUS AND FARM

The grounds and farm contain four hundred acres. Forty acres in the immediate vicinity of the buildings constitute the campus and recreation grounds, which are in lawn, interspersed with flower beds, shrubbery, trees, and driveways. On the campus are located a quarter-mile track, a baseball diamond, a football field, and three cement tennis courts. The remainder is used for farming and experimental purposes.

BUILDINGS

Montana Hall is situated in the center of the college campus. It is three stories high, and has a basement, which furnishes quarters for the department of physics and mechanical drawing. On the first floor are offices for the president, registrar and secretary, a room for the Young Women's Christian association, a class room, and the south half of the first floor contains the reading room and library. and an office for the librarian. The north half of the second floor is devoted to the art department, the arrangement being such that three large rooms can be thrown together by sliding doors. The south half of the second floor is devoted to the departments of mathematics and secretarial studies. The third floor contains the large assembly hall and seven class and music rooms.

Hamilton Hall is the dormitory for women. The rooms are single and in suites, and all rooms have both hot and cold water. In the basement are the store rooms, laundry, quarters for servants, kitchen, and large dining room. The first floor contains reception

rooms, the dean's suite, guest room, and a number of rooms for students. The second and third floors are for students.

Agricultural Hall is a four-story building. The north half of the first floor contains the quarters for dairying, consisting of store rooms, office, class room, butter and cheese rooms, and laboratories. A part of the south half of this floor is used for horticulture and has seed room, office, class rooms, work room and laboratory. The other part of this floor is occupied by the experiment station chemistry laboratory. The north half of the second floor is occupied by the agronomy department, with office, class room, dry land office, soil and grain laboratories. In the south half are offices for the director of the experiment station, director of the extension service, class room, office and laboratory for the department of animal husbandry. Most of the third floor is devoted to home economics and contains two large kitchen laboratories, a dining room, two class rooms, two sewing rooms, and office.

The fourth floor has an assembly room and class rooms for secondary students; and the offices for the principal of the secondary schools, and members of the extension staff.

Adjoining the Agricultural Hall on the south is the greenhouse, in the center of the front is a palm room, and on both sides flower and vegetable rooms. Through the center is a plant breeding room and on the west a propagating room.

A new and modern Chemistry Building will be ready for occupancy by September, 1919. The building now under construction is a unit of a larger building plan to be considered as the demands of the institution increase.

The building is a reinforced concrete, fire-proof structure, and is heated by a steam direct-indirect system, which provides ample ventilation for all rooms. In addition there is a separate ventilation system for the hoods. Pipe lines for water, drainage, air pressure, vacuum, hot water, distilled water and hydrogen sulphide have been provided. Several of the laboratories are provided with electric circuits for both heat and power.

The sub basement contains rooms for the ventilation machinery, and the mechanical equipment required to operate the vacuum and air pressure systems. The sub-basement also furnishes quarters for storage and for the preparation of samples for analysis by the chemistry department of the Experiment Station.

The laboratories for agricultural, organic, food chemistry and analytical chemistry are located in the basement. The basement also furnishes quarters for a food and drug laboratory and for a water and sewage laboratory where the work, required by the State Board of Health in enforcing the State Food Law and some of the State sanitary laws, is carried on. A large laboratory for industrial chemistry and chemical engineering is also located in the basement.

The department office and library, a class room, and the research

laboratories of the chemistry department of the Experiment Station are located on the first floor.

The second floor furnishes quarters for the laboratory of general chemistry, a store room, a fuel laboratory, two offices, and a large lecture room seating about two hundred students.

The attic floor furnishes quarters for the geological collections and a mineralogical laboratory. On this floor also is a room housing the distilling apparatus which provides distilled water to be distributed to all laboratories, and a room for a hydrogen sulphide generator, to which are connected the pipe lines furnishing the laboratories with hydrogen sulphide.

The Biology Building is three stories with basement. On the top floor is a lecture room and a museum containing the zoological collection. On the floor below are three laboratories for bacteriology, botany, and zoology, and an office and work room for the botanist. The west half of the first floor is a large laboratory for general biology, and the east half is occupied by the office, library and work room for the entomologist. The basement contains work rooms, class rooms, store rooms, herbarium room and dark room. Attached to this building on the south is a greenhouse for botanical purposes, and an insectary, for the study of living insects. The greenhouse is divided into two rooms, one for experimental work, and the other for laboratory use.

The Engineering Laboratory is a two-story building, with a frame annex. The first floor contains the dynamos, motors, and other machinery and apparatus, offices and students' reading room. The second story is occupied by the storage battery, photometer and electric light rooms, class rooms and offices. The first floor of the annex contains the cement laboratories, and the second floor is used for electrical designing. There is also laboratory space, occupied by material testing machines, a refrigerating machine, various steam and gas engines, tractors, etc. This last named laboratory also contains a large flume for hydraulic testing and a weir box for determining constants used for various forms of weirs. Adjoining the laboratory on the west is the heating plant for the college.

The shops contain a forge shop, a machine shop, an office, a wash room and a tool room. It has one wing for wood work, and another for foundry use.

The Barracks, built for the Students' Army Training Corps, have been converted into dormitories for men. There are rooms for study and recreation, sleeping rooms, a large dining hall, a well equipped kitchen, and shower baths.

The Gymnasium is a frame building. On the ends and the sides are permanent seats, amphitheater style. It furnishes a convenient place for gymnasium practice, basketball and other indoor athletics. An addition at the rear and sides provides a director's office, two

locker rooms, dressing rooms for women, shower and needle bath rooms, and a material room.

The College Farm Buildings are eight in number, located on the college farm adjacent to the campus. These buildings are the dairy barn, veterinary building, horse barn, beef cattle barn, sheep barn, seed barn and granary, the piggery and poultry plant.

COLLEGE SURROUNDINGS

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee & St. Paul railroad. For convenience, healthfulness and beauty of surrounding the location is unsurpassed. The College is situated on an elevation which commands a view of one of the most fertile valleys in the world, covered far and wide with grain fields, and surrounded on all sides by lofty mountains.

Bozeman is a city of homes and churches, with a wholesome moral environment. It is a most desirable residence city for families who wish to educate their children. The college is reached from the railroad stations and city by an electric car line.

EXPENSES OF STUDENTS

BOARD AND ROOM FOR MEN

The Barracks built by the State and Federal Government for the accommodation of the S. A. T. C. have been converted into living quarters for men students. They are equipped with dormitories, kitchens, dining rooms, study rooms, game rooms, shower baths, and all facilities for comfort and convenience.

The rate for board and room is \$22.50 per month, with an additional charge of fifty cents per month for laundry. A deposit of \$5.00 is charged to cover breakage, damage or unnecessary expense caused by accident, carelessness or intention. The unused portion of the deposit will be refunded at the end of the year.

Fraternity houses are maintained by students which accommodate a number for board and room. Students who do not live in the men's dormitory may find room and board in private families convenient to the college, for \$26 to \$35 per month. The total college expenses for the year, including fees, books, room, board and incidental expenses, may be estimated from \$325 to \$425. A list of approved places with prices and accommodations is kept in the Registrar's office. A committee of students meets all trains on registration days and at other times on request, and aids in finding satisfactory locations.

BOARD AND ROOM FOR WOMEN

Hamilton Hall is the college home for women. The Hall is under the supervision of the house director, and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to location and size of room. Because of the unusual fluctuation of food costs the following prices are subject to change at any time during the year:

One in single room.....	\$27.00
Two in single room (each).....	\$25.50
Two in double room (each)	26.00
Two en suite (each)	29.00
Three en suite (each)	27.00

The above prices are for a calendar month. Of these amounts \$20.00 is for table board and the remainder for room rent. Application for rooms in the hall may be made at any time to the house director, and must always be accompanied by a deposit of \$5.00 to insure a reservation. This amount will be returned if the house director is notified before September 26th, or will be deposited until the room is vacated. When a room is vacated if, in the judgment of the house director the room and furniture have not been injured more than could be expected from the ordinary wear and tear, the \$5.00 shall be refunded. If either the room or the furniture has been injured more than would be due to ordinary wear and tear, such portion of the \$5.00 shall be retained by the institution as will be needed to make good the damage. Residents who leave the hall before the close of the quarter will be required to pay the room rent till the end of the quarter. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of \$1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before registration day, and no deduction will be made for late arrivals. The Hall will not be open for occupancy until the day before registration day. No deduction is made for absences at week-ends or during vacations, except at the Christmas holidays, when room rent only will be paid. The residents may have guests at meals by making arrangements for same at the house director's office the day before, and may also have the privilege of the laundry by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have same laundered; also white scrim curtains, a napkin ring and any room decorations they may fancy.

RAILROAD FARE REFUNDS

In accordance with the provisions of Chapter 123 of the Session Laws of 1917, enacted by the Fifteenth Legislative Assembly, and

under regulations established by the State Board of Education, railroad fare in excess of five dollars actually paid by any student for a round trip between his Montana home and any institution of the University of Montana once each year, will be refunded.

No war tax that has been paid by any student will be refunded under any conditions whatever.

FEES AND DEPOSITS.

A fee is a fixed charge, no part of which is returnable except as specified under refunds. A deposit is intended to serve as a security against losses and breakage. Any unused balances are returnable.

Registration Fee\$10.00

Payable annually in advance by each college student in attendance during the autumn, winter, or spring quarter. In no case will any part of this fee be refunded

Short Course Registration Fee\$ 6.00

Payable annually in advance by each student in the School of Agriculture, the School of Home Economics, and the School of Mechanic Arts. In no case will any part of this fee be refunded.

Registration Fee, Summer Quarter\$10.00

Payable in advance by all students attending the summer quarter. In no case will any part of this fee be refunded.

Associated Students Activity Fee\$ 7.50

Payable annually in advance by all college students entering the autumn quarter. Students entering the winter or spring quarter pay \$2.50 per quarter.

Associated Short Course Students Activity Fee.....\$ 5.00

Payable annually in advance by each student in the School of Agriculture, the School of Home Economics, and the School of Mechanic Arts. Students entering the winter quarter pay \$2.50 per quarter.

Late Registration Fee, during the first week of the quarter.....\$ 2.00

Payable by students registering after the prescribed registration days of any quarter, except students entering for the first time.

Fee for Removing Conditions\$ 2.00
 Payable by students who take condition examinations
 at times not regularly designated in the calendar.

Limited Registration Fee, each course, per quarter.....\$ 2.00
 Payable by special students registering for not more
 than two courses. The total credits for the courses
 shall not exceed six.

Special Attendance Fee, each course, per quarter.....\$2.00
 Payable by adults not regularly registered but attend-
 ing classes as listeners.

Library Deposit\$ 3.00
 Payable by all students.

Men's Dormitory Deposit\$ 5.00
 Payable by all men who live at the Men's Dormitory.

Note:—The following fees and deposits are given per quarter:

Agriculture.

Number of Course	Fee.	Deposit.
Agronomy: 1, 2, 11.....	\$1.00	\$1.00
Agronomy: 5,	1.00	.00
Agronomy: c	1.00	.00
Animal Husbandry: a, b, c, 1, 1a, 2, 2a, 3, 6.....	1.00	.00
Animal Husbandry: e, f, 11	2.00	.00
Dairy: 1, 2,	2.00	.50
Dairy: a	2.00	.50
Dairy: b, c, d.....	1.00	.50
Horticulture: 1	1.50	1.00
Horticulture: 4	5.00	.00
Horticulture: a, 6	1.00	.00
Poultry Husbandry: 46, 48,	1.00	.00
Veterinary Science: 51	2.00	.00

Art

Art: a, b, 1, 1a, 1b, 2, 2a, 3, 3a, 4, 7, 7a, 7c, 8a, 8b, 8c, 9, 15, 16, 18a, 18b.....	.50	.00
Art: 8, 11, 12, 13, 14.....	3.00	.00
Art: 10	2.00	4.00
Art: 19,	1.00 to 5.00	.00

Botany and Bacteriology

	Fee.	Deposit.
Botany: a	1.00	.00
Botany: 1,	2.00	2.00
Botany: 2, 4, 5,	3.00	.00
Botany: 3	3.00	3.00
Botany: 11	1.00	4.00
Bacteriology: 12, 14,	4.00	3.00
Bacteriology: 15,	3.00	2.00

Chemistry

Chemistry: 1,	5.00	3.00
Chemistry: a, 2, 3, 4, 5, 8, 9, 11, 12, 14, 17, 18.....	4.00	4.00
Chemistry: 7,	6.00	4.00
Chemistry: 19, 23,	2.00	2.00

Engineering

Architectural: 1, 4, 10, 11, 14, 15, 16.....	1.00	.00
Civil: 1, 1a, 2, 4, 9, 28, 30, 32, 39.....	1.00	2.00
Civil: 8, 34, 38, 44,	2.00	2.00
Civil: 46,	1.00	1.00
Electrical: 4, 10, 14a,	1.00	5.00
Mechanical: 2,	2.00	2.00
Mechanical: 2a, 4, 15a,	1.00	.00
Mechanical: 2b,	3.00	2.00
Mechanical: 9,	1.00	1.00
Mechanical: 21, 27, 28, 34,	1.00	2.00
Mechanical: 32,	2.00	.00

Entomology and Zoology

Zoology: 1, 2, 3, 12, 13, 15.....	3.00	.00
Entomology: 4, 5, 6, 7,	2.00	.00
Entomology: 8,	3.00	.00
Entomology: 10	2.00	10.00
Entomology: 14	2.00	3.00

Home Economics

Home Economics: a, b, 4a, 12, 13, 14, 16, 19.....	1.00	.00
Home Economics: c,	1.50	.00
Home Economics: e, 11, 11a, 17, 17a, 18, 20.....	2.00	.00
Home Economics: b1, d, j, 7, .....	.50	.00
Home Economics: g, 2, 8, 11b,.....	3.00	.00
Home Economics: 4, 6, 23,	4.00	.00
Home Economics: 10, .....	.00	.50 to 6.00
Home Economics: h, 1b,	2.50	.00

Mechanic Arts

	Fee.	Deposit.
Mechanic Arts: a,	2.00	1.00
Mechanic Arts: d, e, t, q,	1.00	.00
Mechanic Arts: f, g, h, j, r, s, u, w,	1.00	1.00
Mechanic Arts: a1, b1, d1, h1,00	4.00
Mechanic Arts: b,	2.00	2.00

Mineralogy

Geology: 2,	3.00	3.00
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Physics

Physics: a, c, 1a, 2, 4, 5, 9, 16,	1.00	1.00
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Secretarial

Secretarial: 3, 4,	1.00	.00
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Trades and Industry

Trades and Industry: 1, 2, 6,	3.00	.00
Trades and Industry: 3,	1.00	.00

Music**Fees.**

Piano, one half hour lesson per week.....	\$12.00 to \$15.00
Piano, two half hour lessons per week.....	23.00 to 27.00
Piano, ensemble playing	7.00
Voice, one half hour lesson per week.....	15.00
Voice, two half hour lessons per week	27.00
Violin, one 45 minutes lesson per week.....	18.00
Violin, two half hour lessons per week.....	24.00
Violin, one hour ensemble lesson per week.....	18.00
Piano rent, one hour per day	3.00
Piano rent, each additional hour per day	2.50

Dormitory Room and Board

Woman's Dormitory Room and Board, a month.....	\$25.00 to \$29.00
Depending on room.	
Men's Dormitory Room and Board, a month.....	\$22.50

Special Fees for Summer Quarter.

Manual Training	\$1.50
Primary Methods	1.00
Public School Drawing	1.00

REFUND OF FEES.**Registration Fees:**

Registration fees, (including summer quarter registration, late registration, limited registration, and special attendance fees) will not be refunded under any circumstances.

Associated Students Activity Fees:

Students who have entered the autumn quarter and paid the annual associated student activity fee will receive a refund of one half the amount paid if they leave at or before the close of the autumn quarter. There will be no refunds on account of withdrawals after the opening of the winter quarter.

Music Fees:

When music students withdraw before the end of the quarter, \$1.50 will be retained for each lesson period up to the time of withdrawal, and any balance remaining will be refunded.

No piano rentals will be refunded.

Laboratory Fees:

Students withdrawing by the beginning of the second week of any quarter will receive a refund of 90% of the laboratory fees paid for the quarter. Those withdrawing by the beginning of the seventh week will receive a refund of 40% of the laboratory fees paid for the quarter.

REQUIREMENTS FOR ADMISSION

Applicants for admission must be at least sixteen years of age and must present evidence of good moral character.

The completion of a high school or preparatory course of four years is the standard for regular entrance to the freshman class. This must include at least fifteen units of work. The term unit means one subject pursued for at least thirty-six weeks with not fewer than five recitations per week of forty-five or more minutes each. Two periods of laboratory, shop, or drawing work count the same as one recitation.

Applicants for admission without condition to the freshman class must present three units in English composition and literature and are advised to include among the required fifteen units at least the following:

Mathematics, 2 units.

Science, 1 unit.

History, 1 unit.

Admission without condition to the courses in engineering requires three years of mathematics and one year of physics.

Candidates for admission to the school of home economics and mechanic arts and the school of agriculture must have completed the eighth grade in the public schools or its equivalent. There are no set requirements for music and the short agricultural courses, all being admitted who give evidence of being able to profit by the work.

ADMISSION ON CERTIFICATES

Graduates of the accredited high schools of Montana obtain admission by presenting certificates of principals stating subjects taken, time given for each, and grades obtained.

Blanks for such certificates are furnished by the registrar. These should be secured, filled out and filed in the registrar's office on or before the first day of registration.

LIST OF ACCREDITED HIGH SCHOOLS

1918-1919.

District High Schools: Alberton, Anaconda, Baker, Belgrade, Belt, Big Sandy, Billings, Bridger, Broadview, Butte, Chinook, Columbia Falls, Columbus, Conrad, Corvallis, Culbertson, Cutbank, Darby, Fairview, Florence, Forsyth, Fromberg, Glasgow, Great Falls, Hamilton, Hardin, Harlem, Harlowton, Havre, Helena, Hobson, Hysham, Joliet, Jordan, Judith Gap, Laurel, Libby, Malta, Manhattan, Moore, Plains, Plentywood, Polson, Pony, Poplar, Ronan, Rosebud, Roundup, Ryegate, St. Ignatius, Shelby, Sheridan, Sidney, Stanford, Stevensville, Stockett, Terry, Thompson Falls, Three Forks, Valier, Victor, Virginia City, Whitefish, Whitehall, White Sulphur Springs, Worden.

County High Schools: Beaverhead, (Dillon); Broadwater, (Townsend); Carbon, (Red Lodge); Chouteau, (Fort Benton); Custer, (Miles City); Dawson, (Glendive); Fergus, (Lewistown); Flathead, (Kalispell); Gallatin, (Bozeman); Granite, (Philipsburg); Jefferson, (Boulder, Lincoln, (Eureka); Missoula (Missoula); Park (Livingston); Powell, (Deer Lodge); Sweet Grass, (Big Timber); Teton, (Chouteau); Wibaux, (Wibaux).

Private Schools: Academy of Montana Wesleyan College, (Helena); Academy of Mt. St. Charles College, (Helena); Butte Business College, (Butte); Central High School, (Butte); Loyola High School, (Missoula); Mount Angela Ursuline Academy, (Great Falls); Polytechnic Institute, (Billings); Sacred Heart Academy, (Missoula); St. Vincent's Academy, (Helena).

Preparatory work done in other schools than those accredited may receive credit. Applicants from such schools should present certificates, stating the same points as those given from accredited schools. Blanks for this purpose are furnished by the registrar. When

the evidence of certificate is not clear and satisfactory, examinations will be given.

Graduates of high schools not in Montana are admitted on certificates without examination, if such high schools are accredited to their own state universities.

ADMISSION ON EXAMINATION

Applicants wishing to receive entrance credits on subjects for which they do not present satisfactory certificates are required to take examinations on days prescribed in the calendar.

Those who are preparing to take entrance examinations should correspond with the registrar for suggestions in regard to such preparation.

CONDITIONAL ADMISSION

The entrance requirement of the completion of a four-years preparatory course, with at least fifteen units of credit, may be modified in individual cases by permitting the conditional admission of students otherwise qualified if they are entitled to at least thirteen admission units.

Entrance conditions must be removed within one year from the time of admission. This may be accomplished by private study or tutoring and the passing of entrance examinations; by arranging to take the requisite courses in the regular classes of the Gallatin County High School; or by transferring certain college credit hours and counting them toward entrance standing instead of toward graduation.

ADMISSION OF SPECIAL STUDENTS

Students twenty-one years of age or older, not candidates for degrees may be admitted without the usual entrance units, as special students, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired.

Special students may acquire status as regular students and become candidates for degrees upon complying with the rules of admission and graduation.

ADMISSION TO ADVANCED STANDING

Students entering from collegiate departments of other colleges and universities must bring certificates of honorable dismissal.

Grades brought by a student from other institutions of approved standards will be accredited in this college, but only after personal conference with and approval by the head of the department in which

credit is desired. Students must present note books for work in which they have had laboratory courses and desire advance credit.

CREDIT FOR WAR SERVICE

Credits toward the degrees of the college will be granted for definite and measureable attainments of mind resulting from service in the army and navy of the United States. The number of credits allowed for military service will be determined by the instructor in the branch in which application for credits is made, subject to the approval of the committee on military credit and advanced standing. **Application for war service credits must be made by the student not later than twelve months after his discharge from service.**

REQUIREMENTS FOR GRADUATION

Bachelor's Degree—Candidates for the bachelor's degree must complete satisfactorily one of the college courses. Students who are relieved for any reason of the requirements in military science or physical education shall present six additional credits in some other subjects.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course. In calculating points A grade counts three times as many points as credits allowed for the subject, B grades twice as many points, C grades count the same number of points as credits, and D grades count nothing toward graduation.

All students who are candidates for the bachelor's degree must have completed all the required subjects listed in the course and a minimum of 216 credits.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors."

For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a quarter of recitation or lecture work, two or two and one-half hours a week for a quarter of laboratory, shop, library work, or drawing shall count as one credit.

Attention is called to the fact that on October 1, 1917, the definition of the term credit was changed, by the transfer to the quarterly, instead of the semester calendar. The new credit in time value counts just two-thirds as much as the old. Students who received credit on the books prior to October 1, 1917, in computing their standing by the present system should add fifty per cent to the number of credits and points.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one quarter, work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

ADVANCED DEGREES

Master's Degree—The Master of Science degree is conferred in the following departments: Botany and bacteriology, chemistry, entomology and zoology. To become a candidate the student must hold a bachelor's degree from the University of Montana or from another institution of equal rank approved by the committee on graduate studies of the State College of Agriculture and Mechanic Arts. The candidate will be required to meet the following conditions:

1. He shall name the particular branch of science in which he hopes to receive the degree and present evidence of sufficient preparation in this branch.

2. One full year or three quarters of residence study amounting to at least forty-five credits of work is required.

3. There shall be a major subject and one or two minor subjects and at least one half of the work must be done in the major subject.

4. The major work shall be in advance of all undergraduate courses in the college but the minor subjects may be selected from among courses pursued for the bachelor's degree. The minor subjects shall be approved in advance by the committee on graduate studies.

5. The head of the department in which the major work is selected shall be the candidate's class adviser.

6. With the aid of the adviser the candidate shall prepare and submit in writing to the committee on graduate studies, not later than the second week of his resident study, a program of the work which he intends to do as a candidate for this degree. The committee will thereupon report to the candidate and to the faculty its action on the candidacy.

7. The candidate shall present a thesis, which shall be a part of his major work.

8. The candidate will offer himself for examination in his major and minor studies. This examination will be under the supervision of the committee on graduate studies and may be oral or in writing. This committee will appoint a special examining committee.

Graduate students are required to pay the regular matriculation fee and all course fees. They will not, however, be expected to pay the student activity fee.

Engineering Degrees — The professional engineering degrees, Architectural Engineer, Chemical Engineer, Civil Engineer, Electrical

Engineer, and Mechanical Engineer will be conferred on graduates who present satisfactory evidence of professional work of superior quality extending over a period of not less than three years. Candidates for these degrees will be required to meet the following conditions:

1. The candidate shall submit a record of his professional experience and the subject of his thesis to the committee on graduate studies for their approval not later than January first preceding commencement.

2. He shall present a bachelor's degree in the same branch of engineering in which he becomes a candidate for the advanced degree.

3. The candidate shall present a satisfactory thesis.

4. He shall offer himself for examination before a committee of the faculty, which shall be appointed by the committee on graduate studies.

REGISTRATION

Time for Registration—The time set for registration of students is the first two days of the autumn quarter and the first day each of winter and spring quarters. The class room work begins the first day following registration day. Students will not be registered on days not listed for registration, except at the convenience of class advisers between four and five in the afternoon. Those who fail to present themselves for registration on the days designated for registration in any quarter, will be permitted to register later in the first week, only upon the payment of a special fee of \$2.00 in addition to regular fees.

Change of Registration.—A student desiring to change his studies will present his request to his class adviser, who, after consulting all teachers interested, will take such action as he may deem best. A change in course of study is allowed only on the approval of the students' class adviser and the registration committee.

Registration by Mail.—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening, enclosing their credentials, to the registrar of the college, and should state the work which they wish to take. These documents will be examined and the student's classification will ordinarily be determined before his arrival, so that much time in registration may be saved. Those who have been already enrolled in the institution should send a letter to their class adviser several days in

advance of the registration days, stating clearly the work which they plan to take, and in case of elective subjects, stating briefly the reasons for their choice.

If these steps are taken by students, registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail, as specified above, should study carefully the entrance requirements for the courses in which they are interested, and the prerequisites to the various subjects which they wish to take.

SCHOLARSHIP AND ATTENDANCE

Government.—Students are expected to conduct themselves as ladies and gentlemen; those who fail to comply with this demand will be requested to leave the institution.

Leave of Absence.—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

Honorable Dismissal.—Students intending to sever their connection with the institution, either indefinitely or permanently, should report as soon as possible to the president either in person or writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of a quarter), will not be readmitted to the college at any later time, nor will any report of grades in credit for work done here be sent out until satisfactory explanation is made.

Passing Grades.—Passing grades are marked A, B, C, or D. An average standing from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures.—Work not of a passing grade shall be marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade shall be marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is a condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions shall be held on the days designated in the college calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Scholarship.—The names of students making grades of D, E, and F are reported to the registrar's office at intervals approximately six

weeks apart, as indicated in the college calendar. Names of delinquent students are then reported to the scholarship committee, who immediately advise these students of their delinquences. It is the sense of the faculty that students not passing in ten credits are wasting their time and the students and their parents are notified by the scholarship committee that if the students are not passing in ten credits at the next report on the standing of students they are to be recommended to the faculty for dismissal. The report on regular quarterly examinations is considered the same as any other report on standings, and students who fail at the end of any quarter to pass in ten credits must be passing at the time of the first report in the following quarter.

The names of delinquent students are sent to the chancellor, principal, registrar, and class advisers concerned.

Absences.—Students absent from required exercises are reported at the close of each day to the registrar's office. On each Monday morning, there are posted on bulletin boards, the names of those students who are to appear before the absence committee. The committee, or one of its number, may be found each Monday afternoon at four o'clock in the office of the registrar, and deals with the cases of students whose names have been listed for consideration. In the case of frequent, unwarranted absences, the committee shall bring the case before the faculty for discipline. These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors will not be reported until the instructor feels that members of these classes are wilfully remaining away from class and so wasting their time, and then these are to be reported to the absence committee for consideration and to the faculty for discipline. The instructors deal with tardiness in such manner as they deem best.

Assembly.—Students are required to attend the assemblies held on each Friday during the college year, and all special assemblies. The programs of these assemblies consist of addresses, music, recitals, illustrated lectures, etc.

MISCELLANEOUS INFORMATION

EMPLOYMENT AND AID FOR STUDENTS

A number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficient money to pay their expenses for one quarter unless they have engaged work in advance. The college cannot guarantee employment, but those who are willing to give efficient, faithful service have usually found work.

A few students are employed as janitors and assistants in the shops, laboratories and barns. Others care for furnaces, horses and cows in the city, work in stores and at various kinds of house work.

Calls for young lady students to work for their board and room are numerous.

Students readily find employment at profitable wages during the summer vacation.

Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

RESERVE OFFICERS' TRAINING CORPS

The State College has been designated by the war department as one of the institutions for higher education where provision will be made for the maintenance of a Reserve Officers' Training Corps. The course outlined for this corps is entirely different from that of the S. A. T. C. It is practically the plan for military instruction which was in effect before the war. It includes a course in military drill and one in military science; it is required of freshmen and sophomores and is elective with juniors and seniors. Those who carry this course four years are accepted as second lieutenants in the United States army for six months; if, at the end of that period, they elect to remain permanently in the army, they will receive commissions. Certain allowances for maintenance are made to juniors and seniors; freshmen and sophomores are supplied with uniforms. The time required for this course is three hours a week.

STUDENT ORGANIZATIONS

YOUNG WOMEN'S CHRISTIAN ASSOCIATION

The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this end it conducts devotional meetings, Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work has been standardized and is supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. sends delegates to the Northwest Conference and keeps in touch with the state, national and international association.

DEBATING

The management of the work in inter-class and intercollegiate debating, in extemporaneous speaking, and in oratory, is now vested in the manager appointed by the Associated Students, and the Coffee Club, which works in cooperation with the department of English. There is an established debate each year between the freshmen and sophomore classes. There are state contests in oratory and extemporaneous address and several intercollegiate debates.

THE EXPONENT

The students of the college maintain a weekly paper, The Ex-

ponent. The paper is well supported by the students and advertisers and is one of the most important student enterprises. It affords the members of the staff very valuable literary training.

ATHLETIC COUNCIL

This organization, composed of representatives from the faculty, alumni association and student body, has general control over all branches of athletics. Football, basketball, baseball, track and tennis are at present recognized.

BRANCH OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

A branch of this society is maintained at the college. Regular monthly meetings are held, at which original papers are read or those of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however, an Electrical club, which includes all the members of the Institute and all other students in the electrical engineering course.

THE CIVIL ENGINEERING SOCIETY

The students of the department of civil engineering organized this society for the purpose of promoting their interests in matters of practical importance to engineering students and alumni. Prominent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field.

COLLEGE BAND

The college band is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments. One-half credit per quarter is allowed for those who register in band.

GLEE CLUB

Men are admitted upon examination as to musical qualifications and the membership is limited to about sixteen. Instruction and music are furnished free by the music department. Both popular and

high class works are studied. One-half credit per quarter is allowed those who register in glee club.

TREBLE CLEF CLUB

This club for young women corresponds in scope and work to the men's glee club. Membership is limited to about twenty. This club is also under the direction of the music department. Both Glee and Treble Clef clubs appear at college functions and recitals during the year. One half credit per quarter is allowed those who register in this club.

ORCHESTRA

The orchestra is an organization composed of students of the college. The membership numbers about twenty and the club meets twice a week for practice. Some light symphonies are worked out by the orchestra during the year.

AGRICULTURAL SOCIETY

All agricultural students are eligible to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life.

HOME ECONOMICS CLUB

This club is composed of women students who are working for a degree in home economics. Meetings are held for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni of this department.

THE CHEMICAL SOCIETY

The students taking the chemistry course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in regular class work. Regular meetings are held and abstracts of recent journal articles are presented.

THE ALUMNAE CLUB

The active members of this organization are women graduates, residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

ASSOCIATED STUDENTS

An organization consisting of the whole body of students of the institution. The society is organized to manage all matters of general interest to students, as athletics, debates, oratory, and entertainments.

FRATERNITIES, SORORITIES, AND SOCIAL CLUBS

There are two fraternities which are, as yet, only local organizations, the Omega Beta, with a house on South Third avenue, and the Kappa Nu, who maintain a house on South Black avenue. The Sigma Chi, a national fraternity, has a chapter and maintains a house on South Third avenue. There is also a club for men known as Les Bouffons. There are two national sororities, the Alpha Omicron Pi, with a house on South Central avenue, and the Phi Upsilon Omicron; a local sorority, the Phi Gamma, who have a house on West Mendenhall, and the Theta Xi, with a house on South Seventh avenue, and a social club known as the Triple "S." Fraternities, sororities and social clubs, like other student organizations, are under the supervision of the faculty.

SCHOLARSHIPS AND PRIZES

HIGH SCHOOL HONOR SCHOLARSHIPS

In order to promote the attendance of students of ability and promise upon the several institutions of the University of Montana it is the declared policy of the State Board of Education to provide for the awarding of scholarships to be known as "High School Honor Scholarships" to graduates of the accredited public high schools of the state.

In the administration of this policy the number of scholarships awarded each year in any accredited high school will depend upon the number of graduates, as hereinafter specified. In no case, however, will more than two such scholarships be awarded each year in any high school for any one of the institutions of the University. High School Honor Scholarships may be awarded only to students who belong to the highest one-fourth of the graduating class in scholarship.

The following regulations will govern the awarding of High School Honor Scholarships:

1. Upon the presentation of the required certificate from the principal, the Chancellor of the University will authorize the award each year to graduates of each of the accredited public high schools of the state, High School Honor Scholarships for the component institutions of the University of Montana.

2. To be eligible for a High School Honor Scholarship the individual must be certified by the principal:

- (a) To be a graduate of an accredited high school of the state;
- (b) To belong to the highest one-fourth of his class in scholarship;
- (c) To be a student of ability and promise of success in college or professional school; and
- (d) To be the highest in scholarship of those members of the graduating class desiring to attend the university institution for which the honor scholarship is to be awarded.

3. No more than one honor scholarship may be awarded to the membership of any graduating class having seven or fewer graduates; no more than two scholarships may be awarded to the membership of any graduating class having eight to eleven graduates; no more than three scholarships may be awarded to the membership of any graduating class having twelve to fifteen graduates; no more than four scholarships may be awarded to the membership of any graduating class having sixteen or more graduates.

4. No more than two High School Honor Scholarships may be awarded each year in any high school for **any one** of the institutions of the University.

5. The holders of High School Honor Scholarships shall be exempt from the payment of all customary fees except the student activity fees and the special fees in the Schools of Law and Music. All holders of High School Honor Scholarships will be expected to make the required course deposits.

6. Any High School Honor Scholarship will become void unless the holder enters one of the institutions of the University within eighteen months after graduation from the high school. The holder of a High School Honor Scholarship must give notice to the Registrar of the institution of his intention to utilize the scholarship, not later than September first of the year in which he intends to enter the institution.

7. Any High School Honor Scholarship will be valid only as long as the holder is in attendance upon some regular course leading to graduation; provided, however, that no High School Honor Scholarship shall be valid for a period longer than five years.

8. In case any individual to whom has been awarded a High School Honor Scholarship relinquishes the scholarship without entering the institution, or for any reason fails to enter the institution in compliance with Section 6 of the regulations, the high school prin-

cial may certify the next ranking eligible member of the same graduating class desiring to enter the particular institution.

9. The privileges of a High School Honor Scholarship may be retained only so long as the holder maintains a standard of scholarship and regularity of attendance satisfactory to the faculty of the institution at which he is in attendance.

RULES FOR AGRICULTURAL CLUB SCHOLARSHIPS

1. Upon notice from the State Leader of Boys' and Girls' Agricultural clubs of the awards of the annual club contests, the Chancellor will authorize the issuance of Agricultural Club Scholarships to the winners of first place in the corn, potato, garden, bread, garment-making, livestock, or other agricultural club contests in any county in Montana, and to winners of first, second and third places in the state agricultural club contest.

2. The Agricultural Club Scholarship shall be good in any one of the component institutions of the University of Montana which the holder may select, provided that in order to enter such institution, the holder must meet the entrance requirements in effect in such institution at the time the holder seeks to enter.

3. Holders of Agricultural Club Scholarships shall be exempted from the payment of all customary fees except the student activity fees and the special fees in the Schools of Music. They will, however, be expected to make the required course deposits.

4. Scholarships issued to winners of first place in county club contests shall be good for one year of attendance. Those issued to winners of third, second and first place in the state contest shall be good for two, three, and four years of attendance respectively.

5. Any Agricultural Club Scholarship will become void unless the holder enters one of the institutions of the University of Montana within eighteen months after the completion of his preparatory course. The holder must give notice to the registrar of the institution of his intention to utilize the scholarship, not later than September first of the year in which he intends to enter the institution, or immediately upon receipt of the scholarship.

6. Any Agricultural Club Scholarship will be valid only so long as the holder is in attendance upon some regular course leading to graduation, and maintains a standard of scholarship and regularity of attendance satisfactory to the faculty of the institution of the University of Montana at which he is in attendance.

MILITARY SERVICE SCHOLARSHIPS

Upon the proper certification of the president that a student has rendered military or naval service to the nation and has been honorably discharged, the Chancellor of the University of Montana will authorize the award of a Military Service Scholarship to such student. The holders of such scholarships, throughout their course, will be exempt from the payment of all regular fees, but not laboratory deposits or special course tuitions.

By special action of the State Board of Education the privileges of the Military Service Scholarship are extended to all students of the University of Montana, who met the requirements for membership in the Students' Army Training Corps and actually took up work in one of the corps of the University of Montana, but were deprived of induction through the action of the war department cancelling all inductions which were not complete November 11th. 1918.

MONTANA FEDERATION OF WOMEN'S CLUBS SCHOLARSHIPS

Upon the nomination of the officers of the Montana Federation of Women's clubs, the State Board of Education has authorized the award of one scholarship each year in each of the institutions of the University. The holders of such scholarships are exempted from the payment of all customary fees, except the student activity fees and the special tuition fees in music. They are expected to make the required course deposits.

The Federation of Women's Clubs assumes the payment of expenses for board, room rent, necessary books, course deposits, student activity fee, and gymnasium suit.

Y. W. C. A. SCHOLARSHIP

Every four years the Y. W. C. A. offers a scholarship to a woman high school graduate who might otherwise be unable to attend college. Selection of a woman is made from among the applicants on the basis of character and scholarship. The woman elected is given her fees, books, and student activity ticket, and a good home is found where she may work for her room and board.

PRIZE IN ORATORY

An annual prize of twenty dollars is given to the winner of the annual local oratorical contest. This is open to all students. The winner represents the college in the state oratorical contest.

ARMSTRONG PRIZE IN DECLAMATION

Hon. F. K. Armstrong of Bozeman, gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary schools. There is also a second prize of five dollars. Only regular students are eligible.

STORY PRIZE IN EXTEMPORANEOUS SPEAKING

Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an extemporaneous speaking contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

STUDENT LOAN FUNDS

GENERAL UNIVERSITY STUDENT LOAN FUND

The Montana Banker's Association, and the Alumni of the University of Nebraska residing in Montana, have each established funds which are available for students in the junior and senior classes of any of the institutions of the University of Montana, who are unable to continue their studies without financial aid, and are satisfactorily recommended as to character and scholarship by the dean or director, or the head of the department in which the applicant's major work is done. The loan to any one student is limited to two hundred dollars during his course, and not more than one hundred dollars in any one year. Loans must be repaid within one year from the time of borrowing, or in exceptional cases, one year after graduation. Loans bear two per cent interest.

Application blanks and a statement of detailed regulations governing these loans may be obtained from the registrar.

STATE COLLEGE ALUMNI FUND

The Loan Fund Committee of this college makes every effort to assist worthy students who are in need of funds. Senior and junior college students may apply to this committee for a loan.

Whenever possible, students who apply for a loan are aided to find work in order that they may earn the money required for their support.

ATHLETICS

The gymnasium furnishes a convenient place for gymnasium practice, basketball, and other indoor athletics. There are dressing rooms for both men and women, shower and needle bath rooms, and

a material room. On the campus are located a quarter mile cinder track, a baseball diamond, a football field, and three cement tennis courts.

ELIGIBILITY FOR ATHLETICS

The rules governing eligibility of players shall be the same for all athletic contests in which any team plays an officially scheduled contest under the name of the college, whether the game be with another college, a club, or a secondary school. Each student representing this institution in an intercollegiate contest must be eligible according to the Rocky Mountain Faculty Athletic Conference rules.

BASKETBALL TOURNAMENT, SPEAKING CONTEST, AND ESSAY CONTEST

The annual high school basketball tournament, speaking contest and essay contest are held on Wednesday, Thursday, Friday, and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basketball teams, who have, during the basketball season proven their superiority in competition with other teams. Appropriate school trophies are presented to the best teams, and suitable individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest, and an essay contest are held.

LIBRARY AND READING ROOMS

MAIN LIBRARY

The library occupies the south half of the first floor of Montana Hall. It contains 16,314 volumes, not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works in technology, history, science, and literature, as well as with dictionaries, cyclopedias and other reference works.

By Act of Congress the library is a depository and receives all public documents and other printed matter issued by the United States government.

DEPARTMENT LIBRARIES

The agricultural library occupies two rooms on the first floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One room on the first floor of the biology building is used for the library and periodicals of the biological department. A library and reading room is maintained by the College of engineering.

Experiment Station

Associated with the State College is the Montana Agricultural Experiment Station. This Station was established by an Act of Congress, (Hatch Act), passed in 1887, and supplemented by another act, (Adams Act), passed in 1906. By these two acts \$30,000.00 per year is given to the state.

In the words of these Congressional Acts, the purpose of these appropriations is as follows:

"It shall be the object and duty of said Experiment Stations to conduct original researches and verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under the varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative effects on crops of different kinds; the adaptation and value of grasses and forage crops; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories."

These acts define and limit the work of the Agricultural Experiment Station. It must be directed towards the solving of the practical agricultural problems of the state and making that industry more profitable to those engaged in it.

The appropriations from the federal government have been supplemented by State appropriations, which amount to \$60,000.00 for the central station and \$18,000.00 for the sub-stations.

The work covered by the Experiment Station is indicated by the ten departments of work, which are as follows:

Agronomy, Animal Husbandry, Poultry, Horticulture, Farm Management, Agricultural Engineering, Chemistry, Entomology, Botany and Bacteriology, and Veterinary.

The Experiment Station farm consists of about 260 acres of irrigated land adjoining the campus, and the Ft. Ellis farm of about 600 acres of non-irrigated land, some four miles out. Well equipped laboratories are also provided for the various departments, while all the farm buildings are arranged so as to facilitate the experiments with live stock. The equipment and facilities of the Experiment

Station are available to a limited number of students for graduate work.

The great variations in the climate of the state makes necessary the establishment of sub-stations to study the crop possibilities of various sections of the state. At present four such stations are in operation, viz: In the Judith Basin near Moccasin; in the Yellowstone Valley near Huntley; in Northern Montana, near Havre, and in the Bitter Root Valley near Corvallis. The last sub-station is for the study of fruit and garden crops only. While not covering all the climatic regions of the state these sub-stations afford opportunity for the more complete study of the state's agricultural possibilities and particularly of the crops adapted to particular sections of the state.

The results of the studies and observations made by the station staff are published in bulletins, circulars, leaflets, posters, etc. They are distributed free of cost to the people of the state who apply for them. Those who would like to receive the publications as issued may have their names placed on the permanent mailing list and receive the bulletins as soon as issued. Write to the Agricultural Experiment Station, Bozeman, Montana.

Agricultural Extension Service

The co-operative extension work in agriculture and home economics had its official beginning in the passage by Congress of the Smith-Lever Act of May 8, 1914.

It has been organized as the last of the three principal divisions of the State College. All federal and state extension service in Montana in agriculture and home economics has been placed in charge of an extension director.

The field work is grouped into two classes according to the area covered as state and county service. The projects now under way are:

1. Agronomy.
2. Boys' and Girls' Club Work.
3. County Agent Work.
4. Extension Schools.
5. Dairy.
6. Farmers' Institutes.
7. Farm Management Demonstration.
8. Home Economics.
9. Live Stock.
10. Marketing.

Agronomy consists of instruction and demonstrations in field crops, crop rotation, seeds, and soil management.

Boys' and Girls' Club work consists of clubs for corn growing, potato-growing, gardening, pig, calf, colt, and lamb raising, canning, bread, and garment making.

County agents are in twenty-three counties, carrying on local projects in crop demonstrations, community meetings and organization, live stock, dairy, better seed, rodent and insect control, and such incidental problems in farming and country life as may arise.

Extension schools in agriculture and home economics are held in farming communities by special arrangement, three to five instructors being provided by the extension service, classes continuing for three to six days.

The dairy work has to do with better cows, and better breeding sires, cow-test associations, silos and forage crops, feeding, shelter, and co-operative dairying.

Farmers' institutes have been held to the number of from one hundred to several hundred each year for about twenty years in Montana. The plan is to hold one and two-day meetings, in the agricultural centers of each county, each year, with lecturers distinguished as successful practical farmers or as agricultural scientists, at each meeting.

Farm management demonstrations seek to increase good economic farm practices, and eliminate the uneconomic, by keeping farm accounts and records. These are summarized, analyzed and studied. The farmer with this knowledge is able to expand his operations in the right direction, and retrench where it is unprofitable.

Home economics demonstrations in ten counties conducted by trained women seek to improve home conditions, health, and satisfaction in country living.

The live stock project aims at the improvement in live stock, a reduction of stock losses, and a better distribution of farm animals.

The marketing activities keep farmers better informed regarding markets for farm products, promote direct dealing between producer and consumer, and stimulate the production by securing better markets and more profitable sales of farm products.

The division of Extension Service has grown since 1914 from a staff of five people until March 1, 1918, it had a staff of seventy-five people.

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Engineering Extension Service

The Engineering Extension Service has been inaugurated in order to give engineering instruction to those who desire information along engineering lines and who have not the time or the opportunity to attend college. The courses, arranged to aid those engaged in practical work, consist of lectures, discussions, recitations, drawing, etc. When a sufficient number apply for one or more courses, classes are organized and an engineering instructor visits the classes once a week, to lecture or to conduct class recitations. In this way the student comes in close association with the instructor. Among the courses offered are the following:

1. **Shop Calculation.** Calculations of shop problems; size of gear, pulleys, etc.

2. **Drawing Course.** 1. Instruction in the use of instruments, lettering and projections.

3. **Drawing Course.** 2. Development of surface and the drawing of simple machine parts.

4. **Design of Simple Structures.** Determination of stresses in simple structures, including the design of a simple truss in wood and steel. Especially adapted to the needs of carpenters, builders and contractors.

5. **Valve Gears.** A study of valve movements as applied to locomotives and other engines. The Zeuner diagram.

6. **Electrical Machinery.** Direct currents, a study of the construction and operation of direct current machinery.

7. **Electrical Machinery.** Alternating currents, a study of the construction and operation of alternating current machinery.

8. **Heat and Steam.** Nature of heat, use of steam table, efficiency of the perfect engine, compounding, jacketing, superheating.

9. **Internal Combustion Engines.** Gas, gasoline and producer gas engines, gas producers.

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Organization for Instruction

A. The following four-years college courses, each leading to the degree of Bachelor of Science, are offered:

1.—COLLEGE OF AGRICULTURE.

- (a) Agronomy.
- (b) Animal Husbandry.
- (c) Dairy Husbandry.
- (d) Horticulture.

2.—COLLEGE OF ENGINEERING.

- (a) Architectural Engineering.
- (b) Chemical Engineering .
- (c) Civil Engineering.
- (d) Electrical Engineering.
- (e) Mechanical Engineering.

3. COLLEGE OF APPLIED SCIENCE.

- (a) Botany and Bacteriology.
- (b) Chemistry.
- (c) Entomology and Zoology.

4. COLLEGE OF HOUSEHOLD AND INDUSTRIAL ARTS

- (a) Applied Art.
- (b) Home Economics.
- (c) Secretarial Work.

5. COURSES IN VOCATIONAL EDUCATION FOR TEACHERS.

- (a) Agricultural Education and Extension Methods.
- (b) Home Economics Vocational Training.
- (c) Trades and Industry.

B. The following courses, not leading to a Bachelor's Degree, are offered:

- (a) School of Agriculture.
- (b) School of Mechanic Arts.
- (c) School of Home Economics.
- (d) Secretarial Work.
- (e) Course for Nurses.

College of Agriculture.

This college includes four courses, Agronomy, Animal Husbandry, Dairy Husbandry, and Horticulture. For the first two years the work is the same in all courses.

The agricultural course is based on the assumption that the students are familiar with the manual operation of farm work. All students should have at least one year's farm experience before entering the course. In any case, students must furnish satisfactory evidence of having spent six months in practical work on a farm before graduation.

The college is very completely equipped for agricultural instruction. A large agricultural building, which centralizes the work, a one-thousand-acre farm, a large orchard and garden, large and well equipped laboratories for the study of soil and crops, for milk testing and dairy manufacturing and for the study of farm machinery, a large greenhouse well stocked with plants, and several barns and other buildings filled with various breeds of livestock, including beef and dairy cattle, horses, sheep, hogs, and poultry—all these are at the command of the agricultural student.

COURSE IN AGRICULTURE

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Trigonometry and Logarithms (Math. 8) or Elementary Analysis (Math. 16)	4		
Livestock Judging (An. Husb. 1)	3		
History of Agriculture (Agron. 12)	2		
General Botany (Bot. 1)		6	
Livestock Judging (An. Husb. 1a)		3	
Agricultural Physics (Phys. 1a)			6
Principles of Plant Production (Hort. 1)			5
Farm Dairying (Dairy 1)			4
Military Science (Mil. Sci. 1)	1	1	1
*Farm Practice			

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Organic Chemistry (Chem. 5)	6		
Invertebrate Zoology (Zool. 1)	6		
Field Crops (Agron. 1)	4		
Agricultural Chemistry (Chem. 7)		6	
Fruit Growing and Gardening (Hort. 10)		5	
Forage Crops (Agron. 11)		5	
Veterinary Physiology and Anatomy (Vet. Sci. 51) or Economic Entomology (Ento. 4)			5
Forage Crops (Agron. 11)			4
Elective			7
Military Science (Mil. Sci. 2)	1	1	1

* The student's record must show that he has had at least six months farm experience before graduation.

COURSE IN AGRONOMY

JUNIOR YEAR

	Autumn	Winter	Spring
Economics (Econ. 3)	3	3	
Soil Physics (Agron. 2)	4	3	
Soil Fertility (Agron. 3)		4	
Soil Management (Agron. 8)			3
General Bacteriology (Bact. 12).....	6		
Nutrition of Farm Animals (An. Husb. 4).....	5		
Organic Evolution (Zool. 9).....			4
Plant Physiology (Bot. 3)			6
Common Diseases (Vet. Sci. 57)			5
Elective		9	

SENIOR YEAR

Farm Management (Agron. 6)	6		
Principles of Breeding (Agron. 7)	6		
Farm Records and Accounts (Agron. 10)	3		
Farm Mechanics (Agron. 4)		5	
Advanced Grain Judging (Agron. 5)			3
Elective	4	14	16

Note—Students will be required to choose not less than five quarter credits from additional courses offered in the College of Agriculture, and not less than eight quarter credits from courses offered in the College of Applied Science.

COURSE IN ANIMAL HUSBANDRY

JUNIOR YEAR

	Autumn	Winter	Spring
Nutrition of Farm Animals (An. Husb. 4).....	5		
Economics (Econ. 3)	3	3	
General Bacteriology (Bact. 12)	6		
Poultry Management (Poult. 41)		4	
Breeds of Livestock (An. Husb. 2).....		5	
Breeds of Livestock (An. Husb. 2a).....			4
Handling and Fitting Livestock (An. Husb. 11).....			2
Common Diseases (Vet. Sci. 57).....			5
Elective	5	7	8

SENIOR YEAR

Advanced Stock Judging (An. Husb. 3).....	2		
Experimental Feeding (An. Husb. 9).....	3		
Principles of Breeding (Agron. 7)	6		
Beef Cattle and Sheep Production (An. Husb. 7)...		5	
Sanitary Science (Vet. Sci. 56)		3	
Horse, Swine and Dairy Production (An. Husb. 8).....			5
Breeding Farm Animals (An. Husb. 6)			4
Obstetrics (Vet. Sci. 54).....			3
Elective	8	11	7

Note—In the junior and senior years rules for electives are: Sixteen quarter credits required in the College of Agriculture and twelve quarter credits required in the College of Applied Science.

COURSE IN DAIRY HUSBANDRY

JUNIOR YEAR

	Autumn	Winter	Spring
Inspection of Milk Products (Dairy 2).....	3		
Advanced Judging and Extension (Dairy 9).....	3		
General Bacteriology (Bact. 12)	6		
Economics (Econ. 3)	3	3	
Market Milk (Dairy 5)		5	
Breeds of Livestock (An. Husb. 2).....		5	
Creamery Buttermaking (Dairy 3)			6
Breeds of Livestock (An. Husb. 2a).....			4
Elective	4	6	9

SENIOR YEAR

Cheesemaking (Dairy 4).....	6		
Milk Production (Dairy 7)	4		
Dairy Management (Dairy 6)		3	
Sanitary Science (Vet. Sci. 56).....		3	
Factory Management (Dairy 8)			5
Dairy Technology (Dairy 10)			4
Elective	9	13	10

Note—Students will be required to choose not less than fifteen quarter credits offered in the College of Agriculture and not less than twenty-four quarter credits in the College of Applied Science.

COURSE IN HORTICULTURE

JUNIOR YEAR

	Autumn	Winter	Spring
Economics (Econ. 3)	3	3	
Systematic Pomology (Hort. 4).....	4		
Soil Physics (Agron. 2)	4	3	
General Bacteriology (Bact. 12)	6		
Commercial Vegetable Gardening (Hort. 11).....		5	
Plant Physiology (Bot. 3)			6
Organic Evolution (Zool. 9)			4
Elective	2	8	9

SENIOR YEAR

Landscape Gardening (Hort. 6)	4		
Principles of Breeding (Agron. 7)	6		
Plant Pathology (Bot. 4)	6		
Greenhouse Construction and Management (Hort. 5).....		4	
Farm Mechanics (Agron. 4)		5	
Commercial Fruit Growing (Hort. 7) ...			5
Elective	3	10	14

Courses of Instruction.

Note—Animal husbandry and dairy husbandry students will take Veterinary Anatomy and Physiology (Vet. Sci. 51), and agronomy and horticultural students will take Entomology (Ento. 4).

AGRONOMY.

PROFESSORS, A. ATKINSON, F. B. LINFIELD (Dean). ASSISTANT PROFESSORS, E. L. CURRIER, H. E. MURDOCK, L. F. GIESEKER, H. R. SUMNER.

The agronomy course is designed to afford special training in the production of field crops, the cultivation of soils, the maintenance of soil fertility, the management of farms, and the uses of machinery and power for doing the work on the farm. The aim in this work is to fit men to intelligently deal with the many problems arising in the development of western agriculture under dry land and irrigated conditions.

The facilities provided for agronomy instruction include suitably equipped crops and soil laboratories, the crops and materials of the college farm and experimental fields and of the State Grain Laboratory, farm management survey records of over one thousand farms in Montana which represent different systems of management and an equipment of engines, tillage, seeding and harvesting machinery especially provided for instructional purposes.

1. **Field Crops.** 1 Q. Autumn. 4 cr. Prerequisite Botany 1. Fee \$1; deposit \$1. Mr. Sumner.

History, characteristics, uses and methods of growing and handling wheat, oats, barley, corn, flax, and other cereals; judging of grain and use of the grain score card. Lect. 3; lab. 1.

2. **Soil Physics.** 2 Q. Autumn and winter. 7 cr. Prerequisites Physics 1a, Chemistry 5. Fee \$1; deposit \$1. Mr. Sumner.

Soil and its cultivation in relation to growth of crops; origin and formation of soils; soil classification and influence of tillage methods on soil moisture, texture, temperature and aeration. Lect. 2; lab. 2. Lect. 2; lab. 1.

3. **Soil Fertility.** 1 Q. Winter. 4 cr. Prerequisites Chemistry 7, Bacteriology 12. Mr. Sumner.

Maintenance of fertility; use of fertilizers and crop rotations and their influence on the productive capacity of the soil. Lect. 4.

4. **Farm Mechanics.** 1 Q. Winter. 5 cr. Prerequisite Physics 1a. Mr. Murdock.

Development, construction, functions and methods of operating, adjusting and repairing implements, farm machinery, farm motors and tractors. Lect. 3; lab. 2.

5. **Advanced Grain Judging.** 1 Q. Spring. 3 cr. Prerequisite Agronomy 1. Fee \$1. Mr. Sumner.

Study of cereal, grass and forage seeds with practice judging. Commercial grading of grain. Lab. 3.

6. **Farm Management.** 1 Q. Autumn. 6 cr. Prerequisites Agronomy 1, 2. Mr. Currier.

In this course are taught the fundamental principles involved in the efficient organization and management of a farm business. Lect. 4; lab. 2.

7. **Principles of Breeding.** 1 Q. Autumn. 6 cr. Prerequisite Zoology 1. Mr. Atkinson.

Variation, biometry, heredity, selection mutations, hybridization, reversion and prepotency as applied to plants and animals; methods used in improvement of plants. Lect. 6.

8. **Soil Management.** 1 Q. Spring. 3 cr. Prerequisites Agronomy 1, 2. Mr. Sumner.

Methods of handling alkali, gumbo, sandy, heavy clay, muck, peat and worn-out soils; soil problems of irrigated and dry farms. Lect. 3.

9. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Atkinson.

Senior agronomy students may prepare a thesis on some subject approved by the head of the department not later than November 15.

10. **Farm Records and Accounts.** 1 Q. Autumn. 3 cr. Mr. Currier.

Keeping and interpreting farm accounts. Open to juniors and seniors in the College of Agriculture. Lect. 1; lab. 2.

11. **Forage Crops.** 2 Q. Winter and spring. 9 cr. Prerequisite Agronomy 1. Fee \$1; deposit \$1. Mr. Sumner.

History, characteristics and methods of management of grasses, clovers and other crops where the entire plant is cut for hay or used for silage, pasturage or soiling. Lect. 3; lab. 2. Lect. 2; lab. 2.

12. **History of Agriculture.** 1 Q. Autumn. 2 cr. Mr. Linfield. Lect. 2.

ANIMAL HUSBANDRY

PROFESSOR, C. N. ARNETT. ASSISTANT PROFESSORS, R. C. MCCORD, W. E. JOSEPH. INSTRUCTOR, J. O. TRETSVEN.

The course in animal husbandry covers the various phases of live stock production, such as judging, selection, breeding, feeding, care and management for both farm and range conditions.

The aim is to give the student a thorough training in practical and scientific live stock production. The work in judging begins with score card practice and leads to judging groups. Feeding is based upon scientific principles and made as practicable as possible. Study of pedigrees and breeding records gives a knowledge of the most desirable families or strains within the different breeds and points the way to livestock improvement.

This course aims to give a scientific and practical training that fits the student for work in practical and scientific stock farming, also work in teaching and research work in animal husbandry in the various fields.

The department of animal husbandry in the college and experiment station maintains a number of the leading breeds of live stock for use in the class room. This equipment consists of several types of horses; Hereford, Shorthorn, Holstein, and Jersey cattle; Berkshire, Poland China, Duroc Jersey swine; Cotswold, Shropshire and Rambouillet sheep; and several of the leading breeds and types of poultry.

The experiment station also maintains a large number of high grade animals for experimental work that are available for study and offer many practical demonstrations in feeding and management.

The equipment of barns, silos, etc., is of modern plan and construction and affords an excellent opportunity for study.

1. Live Stock Judging. 1 Q. Autumn. 3 cr. Fee \$1. Mr. McChord.

Beef cattle and sheep. Scoring individuals, judging groups, study of live stock markets and market classifications. Lab. 3.

1a. Live Stock Judging. 1 Q. Winter. 3 cr. Fee \$1. Mr. McChord.

Horses, swine, and dairy cattle. Scoring individuals, judging groups, study of livestock markets and market classifications. Lab. 3.

2. Breeds of Live Stock. 1 Q. Winter. 5 cr. Prerequisite Animal Husbandry 1. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of beef cattle and sheep; judging breed type. Lect. 4; lab. 1.

2a. Breeds of Live Stock. 1 Q. Spring. 4 cr. Prerequisite Animal Husbandry 1a. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of horses, swine, and dairy cattle; judging breed type. Lect. 4; lab. 1.

3. Advanced Stock Judging. 1 Q. Autumn. 2 cr. Prerequisites Animal Husbandry 2, 2a. Fee \$1. Mr. McChord.

Continuation of judging and study of market and breeding stock. Beef cattle, sheep, horses, swine and dairy cattle. Lab. 2.

4. Nutrition of Farm Animals. 1 Q. Autumn. 5 cr. Prerequisite Chemistry 5. Mr. Joseph.

Digestion, metabolism, enzyme changes, functions of nutrients, compounding rations, feeding standards, feeds, their uses and adaptability in the ration. Lect. 5.

6. **Breeding Farm Animals.** 1 Q. Spring. 4 cr. Prerequisites Animal Husbandry 2, 2a, Agronomy 7. Fee \$1. Mr. McChord.

Principles and practices of breeding farm animals, tabulation and study of pedigrees. Lect. 3; lab. 1.

7. **Beef Cattle and Sheep Production.** 1 Q. Winter. 4 or 5 cr. Prerequisite Animal Husbandry 4. Mr. Arnett, Mr. McChord.

Feeding, care and management of pure bred and grade beef cattle and sheep. Lect. 4. Lect. 4; lab. 1.

8. **Horses, Swine and Dairy Cattle Production.** 1 Q. Spring. 4 or 5 cr. Prerequisite Animal Husbandry 4. Mr. Arnett, Mr. McChord.

Feeding, care and management of pure bred and grade horses, swine and dairy cattle. Lect. 4. Lect. 4; lab. 1.

9. **Experimental Feeding.** 1 Q. Autumn. 3 cr. Prerequisites Animal Husbandry 4, 7. Mr. Arnett, Mr. Joseph.

Methods, principles and results of experimental work in animal husbandry. Lect. 2; lab. 1.

10. **Thesis.** 1 Q. Autumn or winter or spring. 3 cr. Mr. Arnett.

Animal husbandry students may elect thesis work during the senior year.

11. **Handling and Fitting Live Stock.** 1 Q. Spring. 2 cr. Fee \$2. Mr. McChord, Mr. Tretsvén.

Fitting and handling live stock for show, sale, breeding and work. Lab. 2.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

The course in dairy husbandry embraces both the productive and the manufacturing features of the dairy industry. The first two years are given largely to a study of the general and the agricultural sciences with a view of preparing the student for economic application to practical dairy problems.

The productive phase of the work includes the management of the dairy herd, handling of milk on the farm, transportation, distribution, inspection and marketing of milk. The manufacturing phase deals with the more technical work in separation, testing and preparation of dairy products, factory management, exhibiting, judging and marketing.

The course is designed to fit the student for the rapidly growing demand for men trained in practical, modern dairy science. The positions open are financially attractive, and offer splendid opportunities for rapid advancement, especially as pertains to college, experiment station and educational lines. Of no less importance is the commercial side which deals with milk production, farm, factory, and corporation management; farm, factory, and municipal inspection; dairy manufactures and marketing.

1. **Farm Dairying.** 1 Q. Spring. 4 cr. Fee \$2; deposit \$.50.

Development of the dairy industry, selection of the dairy farm, the cow, the sire, and building up the dairy herd. Secretion, composition, and testing of milk and cream. Care of milk on the farm, operation of hand separators, ripening cream, making butter and marketing dairy products. Lect. 3; lab. 1.

2. **Inspection of Milk Products.** 1 Q. Autumn. 3 cr. Prerequisites Dairy 1, Chemistry 2. Fee \$2; deposit \$.50.

Methods of inspection, scoring stables, dairies, milk depots, factories and markets; composition of milk products in relation to standards of purity. Lect. 2; lab. 1.

3. **Creamery Butter Making.** 1 Q. Spring. 6 cr. Prerequisite Dairy 1.

Handling cream and making butter on a commercial scale, practice in pasteurizing; making starters; ripening cream, churning, packing and storage of butter. Lect. 3; lab. 3.

4. **Cheese Making.** 1 Q. Autumn. 6 cr.

Modern methods of making cheddar cheese adapted to farm and factory practice. Lect. 3; lab. 3.

5. **Market Milk.** 1 Q. Winter. 5 cr.

Relation of the milk supply to producer, distributor, and consumer. Grading and pasteurizing, standardizing, certifying, modifying, bottling, and distribution of milk. Lect. 4; lab. 1.

6. **Dairy Management.** 1 Q. Winter. 3 cr. Prerequisite Dairy 1.

Organization and management of different systems of dairy farms and study of factors in the cost of producing milk. Planning and equipping of barns, silos, stalls, milk rooms, and ice houses. Lect. 2; lab. 1.

7. **Milk Production.** 1 Q. Autumn. 4 cr. Prerequisite Dairy 1.

A study of the milk producing ability of dairy breeds, and of the factors influencing a persistent milk flow as breeding, feeding, and care of the herd. Lect. 3; lab. 1.

8. **Factory Management.** 1 Q. Spring. 4 cr. Prerequisites Dairy 3, 4.

Organization, location, planning, construction and equipping of factories, handling by-products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Lect. 2; lab. 2.

9. **Advanced Judging and Extension.** 1 Q. Autumn. 3 cr. Prerequisites Dairy 1, Animal Husbandry 1a.

The advanced judging of dairy cattle which will include trips to dairy farms and other practice work. Handling exhibits of dairy cattle, organization of cooperative cow testing associations, breeding associations, calf clubs and official registry of cows.

10. **Dairy Technology.** 1 Q. Spring. 4 cr.

Composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts. Lect. 3; lab. 1.

HORTICULTURE.

PROFESSOR, O. B. WHIPPLE. ASSISTANT PROFESSOR, C. C. STARRING.

The four years' course in horticulture, leading to the degree of Bachelor of Science in horticulture, is designed to prepare students as teachers in agricultural colleges, investigators in the agricultural experiment stations, editors of horticultural papers, managers of fruit associations and superintendents of commercial orchards and fruit plantations. The Western United States leads the world in methods of orcharding and disposing of orchard products, and there is a strong and growing demand for persons properly trained to manage the orchard projects now operated throughout the fruit regions of the West. Fruit growing, when done in a scientific way is extremely profitable and presents an inviting field for the trained horticulturist. The college offers good facilities for a thorough training in all branches of horticulture.

1. Principles of Plant Production. 1 Q. Spring. 5 cr. Pre-requisite Botany 1. Fee \$1.50; deposit \$1. Mr. Whipple.

Propagation of plants by spores, seeds, cuttings, layers, graftage, methods of gathering and storing seeds; transplanting. Lect. 3; lab. 2.

4. Systematic Pomology. 1 Q. Autumn. 4 cr. Prerequisites Horticulture 1, Botany 1. Fee \$5. Mr. Starring.

Description and naming of varieties of fruit. Judging of exhibition fruit and discussion of score cards. Evolution of cultivated plants, especially fruits. Lect. 2; lab 2.

5. Greenhouse Construction and Management. 1 Q. Winter. 4 cr. Prerequisites Horticulture 1, Agronomy 2, 3. Mr. Whipple.

Construction, heating and maintaining of greenhouses; growing plants in greenhouses and conservatories. Lect. 4.

6. Landscape Gardening. 1 Q. Autumn. 4 cr. Fee \$1. Mr. Starring.

Laying out and planting of private and public grounds are discussed. Trees, shrubs, and flowers suited to Montana conditions are studied. Lect. 2; lab. 2.

7. Commercial Fruit Growing. 1 Q. Spring. 5 cr. Prerequisites Horticulture 1, 4, Agronomy 2, 3. Mr. Whipple.

Planting, cultivating, irrigating and managing commercial orchards. Methods of picking, grading, packing, and marketing fruits. Lect. 4; lab. 1.

8. Thesis. Credits variable. Mr. Whipple.

Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture.

10. **Fruit Growing and Gardening.** 1 Q. Winter. 5 cr. Pre-requisite Horticulture 1. Mr. Whipple, Mr. Starring.

Principles of orcharding and gardening, with special reference to their bearing upon home orcharding and home gardening. Lect. 5.

11. **Commercial Vegetable Growing.** 1 Q. Winter. 5 cr. Pre-requisite Horticulture 1. Mr. Starring.

Organization and management of market and truck gardens; special problems connected with growing vegetables on a large scale. Preparation of vegetables for market; methods of marketing, storage of vegetables. Lect. 4; lab. 1.

POULTRY HUSBANDRY.

PROFESSOR, W. F. SCHOPPE.

41. **Poultry Management.** 1 Q. Winter. 4 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and brooding, preparation for and marketing of poultry products. Lect. 3; lab. 1.

42. **Poultry Breeds.** 1 Q. Autumn. 6 cr.

Origin and development of the more important breeds of poultry, breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lect. 3; lab. 3.

43. **Incubation and Brooding.** 1 Q. Spring. 4 cr.

Operating incubators, testing eggs, keeping records, operating brooders, care and feeding of chicks. Lect. 2; lab. 2.

44. **Poultry Houses.** 1 Q. Autumn. 6 cr.

Planning, arranging, and designing poultry houses. Lect. 4; lab. 2.

45. **Poultry Feeds and Feeding.** 1 Q. Autumn. 4 cr.

Feeds suited to poultry, grain mixture, etc., feeding for egg production and fattening stock for market. Lect. 2; lab. 2.

46. **Marketing Poultry Products.** 1 Q. Autumn. 4 cr. Fee \$1.

Preparation of poultry and eggs for market, storage, preservation, principles of marketing, killing, picking, and packing poultry. Drawing, boning and trussing fowls for special market. Candling, grading, and packing eggs. Lect. 3; lab. 1.

47. **Advanced Poultry Breeding.** 1 Q. Winter. 4 cr. Prerequisites Agronomy 7, Poultry 42.

Breeding birds for show purposes; judging birds, selection and mating of birds for fancy and utility purposes. Lect. 3; lab. 1.

48. Poultry Culture. 1 Q. Winter. 3 cr. Fee \$1.

Breeds of poultry, their care, housing and feeding. Preparation, grading and packing poultry for market. Methods of marketing. Cold storage poultry. Selection of poultry for the table, drawing, trussing and boning. Candling, grading, and packing eggs for market. Methods of marketing. Preserving eggs for future consumption, methods of storage and means of detecting storage eggs. Elective for junior and senior students in home economics. Lect. 2; lab. 1.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

51. Veterinary Physiology and Anatomy. 1 Q. Winter. 5 cr. Fee \$2.

Physiology of domestic animals, dealing with digestion and assimilation of foods, the circulation and functions of the blood, the nervous system and organs of special sense, and muscles and phenomena of locomotion. Lect. 4; lab. 1.

53. Pathology. 1 Q. Autumn. 3 cr. Prerequisite Veterinary Science 51.

Study of normal and pathological tissues. Gross and microscopical specimens will be used for demonstration. Lect. 1; lab. 2.

54. Obstetrics. 1 Q. Winter. 3 cr. Prerequisite Veterinary Science 51.

Diseases of domestic animals incident to reproduction. Normal parturition, dystokia, and care of the newborn; illustrated by clinic cases. Lect. 2.

56. Sanitary Science. 1 Q. Autumn. 3 cr. Prerequisite Veterinary Science 57 or Bacteriology 12.

Care and handling of farm animals affected with contagious and infectious diseases. Methods of diagnosis, treatment, quarantine and general preventative measures. Lect. 2.

57. Common Diseases of Animals. 1 Q. Winter. 5 cr. Prerequisite Veterinary Science 51 or Bacteriology 12.

Diagnosis and first aid treatment of the more common ailments of live stock. Farm sanitation and general measures for disease prevention. Illustrated by clinic cases. Lect. 5.

College of Engineering.

The rapid development of the State of Montana makes the profession of engineering one of great importance. The development of our natural resources will require the services of engineers with specialized training. At no time has there been so great a demand for engineers as now, and the indications are that this demand will continue for years to come. The College of Engineering has grown rapidly during the past few years.

All engineering courses supported by the state, except the course in mining engineering at the School of Mines at Butte, are concentrated in the State College at Bozeman. As a result of this concentration of effort, the best possible instruction is provided by the State.

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COURSE IN ARCHITECTURAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Mechanical Drawing (M. E. 1)	4		
Engineering Mathematics (Math. 2)		6	
Descriptive Geometry (M. E. 3)		3	4
Engineering Mathematics (Math. 3)			6
Architectural Drawing (Art 3)			4
Engineering Lectures (A. E. 50)			1
Military Science (Mil Sci. 1.)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Engineering Mathematics (Math. 5)			6
Architectural Drawing (Art 3a)	3	3	2
Building Sanitation (A. E. 5)	2		
Elementary Design (A. E. 4)		2	
Theoretical Mechanics (C. E. 5)			5
Working Drawings (A. E. 1)			3
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Mechanics of Materials (C. E. 6)	5		
Strength of Materials (C. E. 8)	1		
Graphic Statics (C. E. 28)	3		
History of Architecture (A. E. 2)	3	3	
History of Architecture (A. E. 3)			3
Roofs and Bridges (C. E. 29)		4	
Masonry Construction (A. E. 14)		4	
Specifications and Working Drawings (A. E. 6)		3	
Engineering Economics (C. E. 45)			4
Hydraulics (C. E. 43)			2
Estimating (A. E. 8)			3
Specifications and Working Drawings (A. E. 7)			3
Elective	4	2	4

SENIOR YEAR

Steam and Gas (M. E. 7)	3		
Bridge Design (C. E. 30)	5		
Architectural Engineering (A. E. 15)	4		
Decoration (A. E. 10)	3		
Electric Power (E. E. 14)		4	
Architectural Engineering (A. E. 16)		4	
Illumination (E. E. 19)		3	
Heat and Ventilation (M. E. 24)			2
Contracts and Specifications (C. E. 23)			2
Steel Mill Buildings (A. E. 11)		3	
Concrete Construction (C. E. 32)			4
Cement and Concrete (C. E. 34)		2	
Foundations and Masonry (C. E. 21)			4
Thesis (A. E. 12)			5
Elective	4	3	2

COURSE IN CHEMICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	6
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing (M. E. 1)	2		
Technical Lectures (Chem. 22)	1	1	1
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Qualitative Analysis (Chem. 2)	5		
Quantitative Analysis (Chem. 3)		5	5
Military Science (Mil. Sci. 1)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Physical Chemistry (Chem. 19)		5	5
Organic Chemistry (Chem. 9)	5	5	5
Mechanism (M. E. 5)	3		
Advanced Heat (Phys. 16)	4		
Light and Sound (Phys. 3)			3
Physical Measurements (Phys. 4)			2
Engineering Chemistry (Chem. 12)			4
Quantitative Analysis (Chem. 4)	4		
Foundry (M. E. 4)		2	
Electrical Power (E. E. 14)		4	

SENIOR YEAR

English Composition (Eng. 3)	2	2	2
Industrial Chemistry (Chem. 14)	5	5	5
Seminar (Chem. 20)	1	1	1
Electro Chemistry (Chem. 23)	5		
Mechanical Laboratory (M. E. 15a)		2	
Fuel and Oil Analysis (Chem. 17)		3	
Principles of Business (Sec. 14)			4
Elective	6	6	7

COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing (M. E. 1)	4		
Descriptive Geometry (M. E. 3)		3	4
Land Surveying (C. E. 1)			3
Engineering Lectures (C. E. 50)			1
Military Science (Mil. Sci. 1)	1	1	1

Note—Fourth quarter. Summer school in surveying (C. E. 4a) six weeks.

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Plane Surveying (C. E. 2)	5		
Topographical Mapping (C. E. 46)		5	
Railroad Engineering (C. E. 4)			5
Military Science (Mil. Sci. 2)	1	1	1

Note—Fourth quarter. Summer school in surveying (C. E. 4b) six weeks.

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Mechanics of Materials (C. E. 6)	5		
Hydraulics (C. E. 37)		4	
Engineering Economics (C. E. 45)			4
Strength of Materials (C. E. 8)	1		
Roofs and Bridges (C. E. 29)		4	
Hydraulic Engineering (C. E. 15)		4	4
Graphic Statics (C. E. 28)	3		
Railroad Engineering (C. E. 9)	3		
Astronomy (Math. 6)			3
Least Squares (Math. 12)			3
Engineering Chemistry (Chem. 12)	4		
Geology (Geol. 1)		4	
Highway Engineering (C. E. 7)			3
Hydraulic Laboratory (C. E. 38)			1

SENIOR YEAR

Irrigation Engineering (C. E. 36)	4		
Sanitary Engineering (C. E. 14)		4	
Concrete Design (C. E. 32)			4
Bridge Design (C. E. 31)		3	
Foundations and Masonry (C. E. 21)			4
Bridge Design (C. E. 30)	5		
Municipal Engineering (C. E. 3)	3		
Electric Power (E. E. 14)		4	
Geodesy (C. E. 17)	3		
Contracts and specifications (C. E. 23)			2
Cement Laboratory (C. E. 34)		2	
Seminar C. E. 12)	1		1
Highway Engineering (C. E. 35)		3	
Elective	4	3	5

COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing (M. E. 1)	2		
Descriptive Geometry (M. E. 3)		3	4
Shop Work (M. E. 2)	2		
Machine Work (M. E. 9)			3
Engineering Lectures (E. E. 50)			1
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Electrical Machinery (E. E. 1)	3		
Electrical Diagrams (E. E. 7)	2	3	3
Surveying (C. E. 1a)		2	2
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Mechanics (C. E. 6)	5		
Dynamos and Motors (E. E. 3)	3	3	
Electricity and Magnetism (Phys. 5)	3	3	
Engineering Economics (C. E. 45)			4
Applied Electricity (E. E. 5)			4
Dynamo Design (E. E. 8)	2	2	3
Heat Power (M. E. 18a)			3
Steam and Gas (M. E. 7)		3	
Strength of Materials (C. E. 8)	1		
Seminar (E. E. 17)	1	1	1
Electrical Laboratory (E. E. 4)		2	3
Mechanical Laboratory (M. E. 15a)		2	

SENIOR YEAR

Alternating Currents (E. E. 9)	4	4	4
Electrical Design (E. E. 13)	3	3	3
Electrical Laboratory (E. E. 10)	3	3	2
Thesis (E. E. 20)	3	3	3
Contracts and Specifications (C. E. 23)			2
Seminar (E. E. 17)	1	1	1
Elective	4	4	3

COURSE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			4
Mechanical Drawing (M. E. 1)	2		
Descriptive Geometry (M. E. 3)		3	4
Shop Work (M. E. 2)	2		
Machine Work (M. E. 9)			3
Engineering Lectures (M. E. 50)			1
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Mechanism (M. E. 5)	3		
Mechanism (M. E. 8)		3	3
Machine Work (M. E. 21)	2		
Foundry (M. E. 4)		2	
Pattern Work (M. E. 2a)			2
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics Econ. 3)	3	3	
Engineering Economics (C. E. 45)			4
Mechanics of Materials (C. E. 6)	5		
Electrical Power (E. E. 14)		4	
Electrical Power (E. E. 14a)			4
Thermodynamics (M. E. 18)	5	5	2
Machine Design (M. E. 13)		3	3
Mechanical Laboratory (M. E. 15)	3		
Mechanical Laboratory (M. E. 20)		2	2
Heat and Power (M. E. 24)			2
Machine Work (M. E. 21)	2		
Strength of Materials (C. E. 8)	1		
Machine Tool Work (M. E. 27)		2	2

SENIOR YEAR

Gas Power Engineering (M. E. 22)	4		
Mechanical Engineering of Steam Power Plants (M. E. 26)		4	
Plant Design (M. E. 29)			3
Engine and Turbine Design (M. E. 23)	4	4	
Commercial Engineering (M. E. 25)			4
Mechanical Laboratory (M. E. 28)	2		
Hydraulics (C. E. 37)		4	
Hydraulic Laboratory (C. E. 38)			2
Seminar (M. E. 11)	1	1	1
Contracts (C. E. 23)			2
Thesis (M. E. 33)	1	2	3
Elective	7	4	4

Courses of Instruction.

ARCHITECTURAL ENGINEERING.

PROFESSOR, W. R. PLEW.

The rapid increase in population in the State of Montana will result in a healthy growth of our cities and towns. Homes, factories, office buildings and public buildings will be erected.

In addition to the science which are common to all engineering courses, this course includes a thorough study of freehand drawing and the drawing of architectural designs. Ancient and modern architecture is studied in all its phases in order that the student may become acquainted with the proper architectural forms. The construction of steel and concrete buildings, the sanitation of buildings, interior and exterior decoration, and illumination, form an important part of the instruction given.

The course is intended to provide the training which the student will need to prepare himself for work as an architectural engineer, building superintendent, contractor or builder.

1. Working Drawings. 1 Q. Spring. 3 cr. Fee \$1.

Detailing on a large scale, floors, windows, stairs, cornice, cabinet making and conventional methods in architectural drawing. Lab. 3.

2. History of Architecture. 2 Q. Autumn and winter. 6 cr.

History of architectural design from early Egyptian to Renaissance, illustrated by lantern slides. Lect. 2; lab. 1.

3. History of Architecture. 1 Q. Spring. 3 cr.

A continuation of the above, with special reference to modern times. Lect. 2; lab. 1.

4. Elementary Design. 1 Q. Winter. 2 cr. Fee \$1.

Rendering of the orders and sketch problems involving simple composition. Lab. 2.

5. Building Sanitation. 1 Q. Autumn. 2 cr.

Design and installation of plumbing; removal of waste, sewage disposal, water supply and fixtures in dwellings and public buildings. Lect. 2.

6. Specifications and Working Drawings. 1 Q. Winter. 3 cr.

Plan and framing problems; balloon framing, detailing of walls, etc. Lab. 3.

7. **Specifications and Working Drawings.** 1 Q. Spring. 3 cr.
Masonry details, stereotomy, and building specifications. Lect. 3.

8. **Estimating.** 1 Q. Spring. 3 cr.
Estimating building costs. Lect. 3.

10. **Architectural Decoration.** 1 Q. Autumn. 3 cr. Fee \$1.
Interior and exterior ornamental design and finish of buildings.
Lab. 3.

11. **Steel Mill Building.** 1 Q. Winter. 3 cr. Prerequisites Civil Engineering, 28, 29. Fee \$1.

Designs of trusses in framed bents; arches; mill building construction, slow burning and fire proof construction, specifications.
Lab. 3.

12. **Thesis.** 1 Q. Spring. 5 cr.

13. **House Planning.** 1 Q. Winter. 1 cr.
For students in home economics. Lab. 1.

14. **Masonry Construction.** 1 Q. Winter. 4 cr. Fee \$1.
The study of building stones and their preparation for use in the wall. Design of masonry construction with special reference to its use in building construction. Stereotomy. Lect. 3; lab. 1.

15. **Architectural Engineering.** 1 Q. Autumn. 4 cr. Prerequisites Civil Engineering 6, 29, concurrently with Civil Engineering 30. Fee \$1.

Design of steel framework in modern building construction.
Lab. 4.

16. **Architectural Engineering.** 1 Q. Winter. 4 cr. Prerequisite Architectural Engineering 15. Fee \$1.

Design of larger buildings, methods of construction fireproofing.
Lab. 4.

50. **Engineering Lectures.** 1 Q. Spring. 1 cr. Engineering Faculty.

Lectures on general engineering subjects dealing with the engineering profession and its development. Lect. 1.

CHEMICAL ENGINEERING

PROFESSOR, W. M. COBLEIGH. ASSISTANT PROFESSOR, E. J. QUINN.
INSTRUCTOR, E. C. HYTREE. ASSISTANT, GLADYS RITZ.

The courses of instruction that constitute the four years course in Chemical Engineering are chosen to train men to take a leading part in the development and operation of those industries and manufacturing pursuits which are based on the applications of chemistry.

The work of this course can be classified in three groups: First, courses which provide a thorough knowledge of the principles of general, analytical, physical, organic and industrial chemistry; second, those courses which provide a knowledge of mathematics, physics and engineering, including both mechanical and electrical engineering subjects; third, courses which give the student training in chemical engineering proper. In these courses the principles of chemistry and of engineering are applied to industrial operations.

Inspection trips are made to the various industrial plants in the state. The studies carried on at these plants are carefully systematized in order to give the student an opportunity to observe the application of the principles of chemical engineering.

1. General Chemistry. 3 Q. Autumn, winter, spring. 18 cr. Fee \$5; deposit \$3. Mr. Cobleigh, Mr. Hytree and assistants.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds, and elementary qualitative analysis. Lect. 4; lab. 2.

2. Qualitative Analysis. 1 Q. Autumn. 5 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Quinn.

The course is presented from the standpoint of modern theories of chemistry. Lect. 4; lab. 2.

3. Quantitative Analysis. 3 Q. Autumn, winter and spring. Continuous. 12 or 15 cr. Prerequisite Chemistry 1 or 2. Fee \$4; deposit \$4. Mr. Quinn.

Theory and technic of the methods of analytical chemistry and chemical calculations. Lect. 2; lab. 2. Lect. 2; lab. 3.

4. Quantitative Analysis. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisites, Chemistry 3, 5. Fee \$4; deposit \$4.

A continuation of Chemistry 3. Analysis of organic substances. Lect. 2; lab. 3.

9. Organic Chemistry. 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Hytree.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

12. Engineering Chemistry. 1 Q. Autumn or spring. 4 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel, and copper. Qualitative and approximate quantitative examinations of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 2.

14. **Industrial Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 2, 3, 9. Fee \$4; deposit \$4. Mr. Cobleigh.

The application of chemistry to the industries, including the operations common to many chemical industries such as crushing, grinding calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. The laboratory work in the spring term is taught from the viewpoint of chemical engineering. Lect. 3; lab. 2.

17. **Fuel Analysis.** 1 Q. Winter or spring. 3 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Production and analysis of solid, liquid, and gaseous fuels, illuminating gas, and lubricating oils. Lect. 1; lab. 2.

18. **Water Analysis.** 1 Q. Winter or spring. 4 cr. Prerequisites Chemistry 1, 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewages, and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. **Physical Chemistry.** 2 Q. Winter and spring. 10 cr. Prerequisite Chemistry 3. Fee \$2; deposit \$2. Mr. Hytree.

Theoretical chemistry, including stoichiometry, radio-activity, the electron theory, the gas laws, kinetic theory of gases, liquids, solids, colloids, osmotic pressure, theory of solution, and the phase rule. Lect. 3; lab. 2.

20. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hytree.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are discussed. Lect. 1.

21. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hytree.

Students in the chemistry course may in the senior year prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab. 2.

22. **Technical Lectures.** 3 Q. Autumn, winter, spring. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hytree.

Serves the purpose of so called orientation lectures, designed to give the freshman in chemistry an appreciation of the field of chemistry in practical affairs, and to give him a more adequate outlook on the training required by professional chemists.

23. **Electro Chemistry.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 19. Fee \$2; deposit \$2. Mr. Hytree.

Including the following topics: Electrical conductance, equilibrium, and hydrolysis, electromotive force, electrolysis, and polarization.

CIVIL ENGINEERING

PROFESSORS, L. D. CONKLING, W. R. PLEW. ASSISTANT PROFESSOR, F. C. SNOW.

The civil engineering course is arranged to give a broad training in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems, they are taught the underlying principles of engineering and inspired with a desire to do their best work. The students study many problems connected with the location and construction of railroads, public highways, bridges, water works, water power development, irrigation, sewage systems, and sewage disposal, city and municipal engineering.

The freshman year is devoted to fundamental studies which give both general culture and preparation for the technical work of the following years.

In the sophomore year the fundamental subjects of mathematics, English, physics, and chemistry are completed, and the technical subjects of civil engineering are begun. The theory of land surveying is taught by lectures, field work and drawing room exercises. The study of the theory and principles of highway and railroad engineering is begun.

The junior year completes the work in theoretical and applied mechanics and railroad engineering. The technical subjects of hydraulic engineering, structures and bridges, theory and design, are begun. The course in economics begun in the autumn quarter of the junior year is continued for three quarters, and consists of the study of such subjects as land, capital, labor, coinage, banking, interest, wages, taxation, etc. The important economic questions of the present time are considered and discussed.

The senior year is devoted to municipal and sanitary engineering, plain and reinforced concrete construction, the design of typical bridges and buildings, with complete working drawings, bill of materials and estimate of cost.

1. **Land Surveying.** 1 Q. Spring. 4 cr. Prerequisite Mathematics
2. Fee \$1; deposit \$2. Mr. Snow.

Theory, adjustment and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping. Lect. 1; lab. 3.

- 1a. **Surveying.** 2 Q. Winter and spring. 4 cr. Prerequisite Mathematics 2. Fee \$1; deposit \$2. Mr. Snow.

Theory, adjustment, and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping, draughting and office work. Lab. 2.

2. **Plane Surveying.** 1 Q. Autumn. 5 cr. Prerequisites Mathematics 2, Civil Engineering 1. Fee \$1; deposit \$2. Mr. Snow.

Computation of areas, dividing of land, the methods of field, hydrographic, mine, and city surveying, barometric and spirit leveling, computation of earth work; map drawing and topographic signs; field work with transit level, and plane table; map drawing from students' field notes. Lab. 3.

3. **Municipal Engineering.** 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 2. Mr. Conkling.

City planning, allotting and platting additions; construction of streets, sidewalks, curbs, gutters, and parkings; disposal of refuse; city parks and their paths, walks, and roadways; law affecting the work of the city engineer. Lect. 3.

4. **Railroad Engineering.** 1 Q. Spring. 5 cr. Prerequisite Civil Engineering 2. Fee \$1; deposit \$2. Mr. Snow.

Railroad reconnoissance, preliminary and location surveys. Railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts and crossings. Lect. 1; lab. 4.

4a. **Summer School in Railroad Engineering.** 2 cr. Mr. Snow.

Required of all freshmen civil engineering students at the end of the third quarter. Freshmen act as rodmen, chainmen, axeman, etc.

4b. **Summer School in Railroad Surveying.** 2 cr. Mr. Snow.

Required of all sophomore civil engineering students at the end of the third quarter. A camp is established and regular field work is carried on for two weeks.

5. **Theoretical Mechanics.** 1 Q. Spring. 6 cr. Prerequisite Mathematics 4. Mr. Snow.

Forces and force systems, center of gravity and centroids, stress, principles of equilibrium, rectilinear and curvilinear motion, work and energy, impulse, momentum and vectors. Lect. 6.

6. **Mechanics of Materials.** 1 Q. Autumn. 5 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

Elasticity and strength of timber, brick, stone, and metals. Theory of beams, columns, and shafts. Lect. 5.

6a. **Applied Mechanics.** 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

A short course in the study of the elasticity and strength of the building materials, and the theory of simple beams and short columns. For students in trades and industry. Lect. 3.

7. Highway Engineering. 1 Q. Spring. 3 cr. Prerequisites Civil Engineering 2, 4. Mr. Conkling.

Preliminary investigations; surveying, mapping and design; grading, drainage, and foundations; natural and hard surfaced roads; pavements, etc. Lect. 2; lab. 1.

8. Strength of Materials. 1 Q. Autumn. 1 cr. Prerequisite Civil Engineering 6. Fee \$2; deposit \$2. Mr. Conkling.

Experimental determinations of the strength and the several moduli of the more important of the materials of engineering. Lab. 1.

9. Railroad Economics. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 4. Fee \$1; deposit \$2. Mr. Snow.

Making of profiles, field maps, cross-sections, etc., from students' notes of the field work. Economics of railroad location; arrangement of yards, terminals, and stations. Making location map. Construction of the roadbed. Maintenance of way and the elements of railroad operation. Lect. 1; lab. 2.

12. Seminar. 1 Q. Spring. 1 cr. Mr. Conkling, Mr. Snow.

Members of the senior class meet to discuss the articles that appear in certain assigned engineering periodicals. Lect. 1.

14. Sanitary Engineering. 1 Q. Winter. 4 cr. Prerequisites Civil Engineering 1, 3, 15. Mr. Snow.

Methods of sewage treatment and disposal. The design of a sewage system and a disposal plant; house drainage; specifications and estimate of cost. Lect. 3; lab. 1.

15. Hydraulic Engineering. 2 Q. Winter and spring. 8 cr. Prerequisites Civil Engineering 37, 38. Mr. Conkling.

Precipitation, drainage area, runoff, storage, public water supplies, reservoirs, pipe lines, pumping plants, purification plants, power development, etc. Lect. 3; lab. 1.

17. Geodesy. 1 Q. Autumn. 3 cr. Prerequisites Mathematics 6, Civil Engineering 1, 2, 4. Mr. Snow.

Base line measurements, triangulation balancing surveys and distributing errors, application of the method of least squares, principles of map projection. Determination of azimuth, latitude and longitude, the true north by sun and star observations. Lab. 3.

21. Foundations and Masonry. 1 Q. Spring. 4 cr. Prerequisites Civil Engineering 6, 28. Mr. Conkling.

Materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; specifications and costs. Lect. 3; lab. 1.

23. Contracts and Specifications. 1 Q. Spring. 2 cr. Mr. Conkling.

Correct form of specifications and judicial interpretation placed on technical terms commonly used in engineering specifications. Elective to all engineering students after the sophomore year. Lect. 2.

27. Thesis. 1 Q. Spring. 5 cr. Mr. Conkling.

The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. Subject must be chosen at the beginning of the senior year.

28. Graphic Statics. 1 Q. Autumn. 3 cr. Prerequisites Physics 1, 2, Civil Engineering 5. Fee \$1; deposit \$2. Mr. Flew.

Stresses in roof trusses by the force polygon. Application of equilibrium polygon to beams and girders. Stresses in bridge trusses, retaining walls and masonry arches. Lab. 3.

29. Roofs and Bridges. 1 Q. Winter. 4 cr. Prerequisites Civil Engineering 6, 28. Mr. Flew.

Theory and computation of stress in roof and bridge trusses under dead, live, and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Lect. 2; lab. 2.

30. Bridge Design. 1 Q. Autumn. 5 cr. Prerequisites Civil Engineering 6, 29. Fee \$1; deposit \$2. Mr. Flew.

Designing of girders and trusses; computations and complete drawings for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of materials and estimate of cost. Lect. 1; drawing 4.

31. Bridges and Dams. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 30. Mr. Flew.

Higher structures, including continuous draw, cantilever, and suspension bridges; theory and design of masonry walls, and dams other than the gravity section. Lect. 3.

32. Concrete Design. 1 Q. Spring. 4 cr. Prerequisites Civil Engineering 6, 30. Fee \$1; deposit \$2. Mr. Flew.

Design of reinforced concrete beams and slabs, reinforced concrete buildings and other structures. A complete design of a reinforced concrete arch by the Elastic Theory. Specifications and costs. Lect. 2; lab. 2.

34. Cement Laboratory. 1 Q. Winter. 2 cr. Prerequisite Civil Engineering 6. Fee \$2; deposit \$2. Mr. Conkling.

Manufacture and properties of hydraulic cement, proportioning and mixing concrete. Standard tests of sand and cement. Test of concrete beams, etc. Lab. 2.

35. Highway Engineering. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 7. Mr. Conkling.

Roads and pavements, contracts and specifications; methods of financing; organization and administration; legislation and state laws. Lect. 2; lab. 1.

36. Irrigation Engineering. 1 Q. Autumn. 4 cr. Mr. Conkling.

History of irrigation; the principles of irrigation and location of irrigation system. Lect. 4.

37. **Hydraulics.** 1 Q. Winter. 4 cr. Prerequisites Mathematics 1, 2, 4, Physics 1, 2. Mr. Conkling.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Lect. 4.

38. **Hydraulic Laboratory.** 1 Q. Spring. 1 cr. Prerequisite Civil Engineering 37. Fee \$2; deposite \$2. Mr. Conkling.

Flow of water over weirs, through nozzles and pipes, open channels and conduits, etc. Lab. 1.

39. **Canal Surveying.** 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 1. Fee \$1; deposit \$2. Mr. Snow.

Theory and practice of canal surveying, computation of earth work, field location of canals and ditches for irrigation. Lect. 1; field work 2.

40. **Irrigation Engineering.** 1 Q. Spring. 5 cr. Prerequisites Civil Engineering 36, 37, 38. Mr. Conkling.

Manner of supplying, storing, conveying and distributing irrigation water; management of irrigation systems; irrigation laws. Lect. 5.

41. **Canal Management.** 1 Q. Spring. 5 cr. Prerequisite Civil Engineering 40. Mr. Snow.

Canal management, seepage and drainage. Lect. 5.

42. **Pumping for Irrigation.** 1 Q. Spring. 5 cr. Prerequisites Civil Engineering 37, 38, Mechanical Engineering 15a. Mr. Conkling.

Small rotary and reciprocating pumps. Steam, gas and oil engines used for pumping. Electric motor driven pumps. Lect. 5.

43. **Elementary Hydraulics.** 1 Q. Winter. 2 cr. Prerequisites Mathematics 1, 2, 4, Physics 1, 2. Mr. Conkling.

Elementary course in theoretical hydraulics for students in architectural engineering. Course given each alternate year beginning February 1918.

44. **Concrete Construction.** 2 Q. Winter and spring. 6 cr. Prerequisite Civil Engineering 6a. Fee \$2; deposit \$2. Mr. Conkling.

A study of cements and cement products; their manufacture, storage, etc. The effects of impurities, proportioning and mixing aggregates, upon the strength and life of concrete. The design and methods of construction of simple concrete structures, such as floors, walks, flumes, troughs, small culverts, small cisterns, etc. Lect. 1; lab. 2.

45. **Engineering Economics.** 1 Q. Spring. 4 cr. Prerequisite Economics 3. Mr. Snow.

A study of economic questions of interest to engineers and others engaged in the industries, including methods of valuation of public utilities, commerce commission reports, determination of most economic machines, annuities, interest, perpetuities, present worth, etc.

46. **Topographical Mapping.** 1 Q. Winter. 5 cr. Fee \$1; deposit \$1. Mr. Snow.

Study of the different methods of map projection, such as plane, polyconic, bonnes and mercators. Use of instruments and methods of topographical plotting. Map reading. Methods of using topographical maps in obtaining data of practical value to army, hydro-electric, railroad, highway, and irrigation engineers. Lect. 2; lab. 3.

50. **Engineering Lectures.** 1 Q. Spring. 1 cr. Engineering Faculty.

Lectures on general engineering subjects dealing with the engineering profession and its development. Lect. 1.

ELECTRICAL ENGINEERING

PROFESSOR J. A. THALER. ASSISTANT PROFESSOR, E. THERKELSEN.
INSTRUCTOR, R. D. SLOAN.

The course in electrical engineering is designed to give a thorough technical training in which theoretical subjects and the application of theory to the solution of practical problems are emphasized.

The general training consists of courses in English, mathematics, physics, chemistry, drawing and shop work. The technical work covers the theory and application of electrical phenomena, and the designing and testing of electrical machines and apparatus.

The equipment of the electrical laboratory is very complete, with apparatus of modern type, as well as machines of historical value. The laboratories contain various types of direct and alternating current dynamos and motors, storage batteries, an oscillograph, a 150,000 volt transformer, a wireless station, and other equipment.

1. **Electrical Machinery.** 1 Q. Autumn. 3 cr. Mr. Thaler.

Construction, care and operation of commercial electrical machines and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers, and electrical measuring instruments. Lect. 3.

3. **Dynamos and Motors.** 2 Q. Autumn and winter. 6 cr. Prerequisites Physics 1, Mathematics 4. Mr. Therkelsen.

Principles of electro-magnetism, theory of dynamo electric machines, design, construction and regulation of direct current dynamos and motors. Lect. 3.

4. **Electrical Laboratory.** 2 Q. Winter and spring. 5 cr. Prerequisite Physics 2. Fee \$1; deposit \$5. Mr. Therkelsen.

Determination of armature and field resistance magnetic leakage coefficients, characteristic curves and the efficiency and regulation of various types of direct current machines. Lab. 3.

5. **Applied Electricity.** 1 Q. Spring. 4 cr. Mr. Therkelsen.

Storage batteries, electric lighting and lighting systems. Direct current distribution systems. Lect. 4.

7. **Electrical Diagrams.** 3 Q. Autumn, winter and spring. Continuous. 8 cr. Mr. Therkelsen.

Conventional methods of representing electrical wiring and appliances. National Electrical Code. Diagrams of D. C. Switchboards and electric light wiring. General and detail drawing of dynamos. Lect. 1; lab. 2.

8. **Dynamo Design.** 3 Q. Autumn, winter and spring. Continuous. 7 cr. Prerequisite Electrical Engineering 7. Mr. Therkelsen.

Designing electro-magnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Lab. 2.

9. **Alternating Currents.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite Physics 5. Mr. Thaler.

Theory of alternating currents, properties of alternating current circuits, principles of alternators, transformers, rotary converters and induction motors. Lect. 4.

10. **Electrical Laboratory.** 3 Q. Autumn, winter and spring. Continuous. 8 cr. Prerequisite Physics 5. Fee \$1; deposit \$5. Mr. Thaler.

Tests of alternating current generators, motors and transformers, calibration of alternating current measuring instruments. Lab. 3.

13. **Electrical Design.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Therkelsen.

Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking electrical engineering. Lect. 1; lab. 2.

14. **Electrical Power.** 1 Q. Winter. 4 cr. Mr. Thaler.

Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Lect. 4.

14a. **Electric Power.** 1 Q. Spring. 4 cr. Prerequisite Electrical Engineering 14. Fee \$1; deposit \$5. Mr. Thaler.

Industrial applications of electricity. Electrical equipment of power stations and substations. Efficiency and regulation tests of batteries, transformers, direct and alternating current generators and motors. Lect. 2; lab. 2.

15. **Radio Telegraphy.** 3 Q. Autumn, winter and spring. Continuous. Credits variable. Mr. Thaler.

Theory and practice of radio telegraphy, code instruction, practice in adjusting and operating field sets. Lect. 1; lab. 2.

17. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Thaler.

Weekly meetings for the purpose of discussing current electrical engineering literature. Lect. 1.

18. Special Design. Credits variable. Mr. Thaler.

Design and construction of some special electrical apparatus or machine. Elective for seniors.

19. Illumination. 1 Q. Spring. 3 cr. Mr. Thaler.

Sources of light, laws of photometry and measurement of light, calculation of illumination, electric light wiring, underwriters' rules and symbols of the National Contractors' Association. Lect. 3.

20. Thesis. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Thaler.

Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. The subject for the thesis must be chosen at the beginning of the senior year.

50. Engineering Lectures. 1 Q. Spring. 1 cr. Engineering Faculty.

Lectures on general engineering subjects dealing with the engineering profession and its development. Lect. 1.

MECHANICAL ENGINEERING

PROFESSOR, A. W. RICHTER (Dean). ASSISTANT PROFESSORS, R. T. CHALLENGER, E. THERKELSEN. INSTRUCTORS, F. C. HOMANN, F. KATELEY, J. C. PARK.

The course in mechanical engineering furnishes fundamental training in the science, the art and the business of engineering; the design, operation, superintendence and management of power plants, heating plants, refrigerating plants, lighting plants, pumping plants, and the mechanical equipment of mines and railroads; and for the design, manufacture, installation, testing and operation of shop and laboratory machinery, steam and gas engines and auxiliary equipment.

The course comprises four years' instruction and training by text book, lecture, laboratory and shop practice, based on mathematics, physics, chemistry, mechanics, machine design, structural design and thermodynamics. It is designed to give the student a thorough knowledge of the basic principles of his profession and such technical skill as the application of theoretical principles in every day practice in shop and laboratory will insure. The work of each department, class room, laboratory, shop and designing room is made to supplement the work of each of the others, so that the graduate beginning his profession has a valuable fund of practical and scientific knowledge.

1. Mechanical Drawing. 1 Q. Autumn. 2 or 4 cr. Mr. Challenger.

Use of drawing instruments and plain lettering; problems in geometric construction to teach accuracy in the use of instruments; orthographic projections, dimensions, arrangement, titles. Lab. 2 or 4.

1b. Drawing and Commercial Lettering. 1 Q. Spring. 3 cr. Mr. Challenger.

Lettering; titles; exercises in arranging printed material. Use of instruments; diagrams; simple working drawings. Lab. 3.

2. Shop Work. 1 Q. Autumn. 2 cr. Fee \$2; deposit \$2. Mr. Challenger, Mr. Homann, Mr. Kately.

Use and care of carpenters' tools. Wood work. Elementary pattern work. Iron forging, upsetting and welding. Lab. 2.

2a. Pattern Work. 1 Q. Spring. 2 cr. Prerequisite Mechanical Engineering 2. Fee \$1. Mr. Challenger.

Construction of wood patterns for use in the foundry. Advanced pattern work. Lab. 1.

2b. Wood Work. 1 Q. Autumn. 2 cr. Fee \$3; deposit \$2. Mr. Challenger.

Use and care of carpenters' tools and practice in working dimensions from blue-prints, building construction, roof framing and mill work. Lab. 2.

3. Descriptive Geometry. 2 Q. Winter and spring. 7 cr. Mr. Challenger.

Projection of lines, plane surfaces and solids; intersections, tangents, to curves and surfaces; problems in warped surfaces, practical applications. Lect. 1; lab. 2. Lect. 1; lab. 3.

4. Foundry. 1 Q. Winter. 2 cr. Fee \$1. Mr. Kately.

Floor and bench molding, core making, pouring castings of iron, brass and other alloys. Lab. 2.

4a. Foundry. 1 Q. Winter. 2 cr. Mr. Kately.

Advanced work in molding and core work with practical instruction in the handling of the cupola and the brass furnace. In this course the student is expected to take charge of the cupola in the running of heats. Practical plans for the equipment and arrangement of foundries will be studied and reports on current articles will be required. Lab. 2.

5. Mechanism. 1 Q. Autumn. 3 cr. Prerequisite Mechanical Engineering 1. Mr. Challenger.

Relative motions of machine parts, including rolling cylinders and cones, lobed wheels, belts, levers, cams, linkwork, parallel and car steering mechanisms. Lect. 2; lab. 1.

6. Forge Work. 1 Q. Autumn. 2 cr. Mr. Kately.

The building and manipulation of the fire, with practice in forging, including the drawing, bending, upsetting, and pointing of iron. The welding of mild steel and of iron. First work in tool steel. Lab. 2.

6b. **Forge Work.** 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 6. Mr. Kately.

Advanced work in iron. Manipulation and treatment of tool steel; effect of shrinkage; brazing and the use of welding plates.

7. **Steam and Gas.** 2 Q. Autumn and winter. 5 cr. Prerequisites Chemistry 1, Physics 1, 2. Mr. Richter.

Steam boilers, their classification and construction, combustion and furnace efficiency, the principles underlying the economical transfer of heat from the furnace to the water. Steam and gas engines, scale, corrosion and feed water treatment. Lect. 2.

8. **Mechanism.** 2 Q. Winter and spring. 6 cr. Prerequisites Mechanical Engineering 1, 5. Mr. Challender.

Gearing, cycloidal and involute systems, spur, bevel, helical and worm gears. Change gears, gearing in train, epicyclic trains with special application to automatic feeds and differential transmission. Valve gears. Plain and riding cut-off. Corliss and poppet valves. Lect. 1; lab. 2.

9. **Machine Work.** 1 Q. Spring. 4 cr. Fee \$1; deposit \$1. Mr. Homann.

Bench work in iron, chipping and filing. Lathe work in metals. Boring, planing and milling of metals. Lab. 4.

11. **Seminar.** 2 Q. Winter and spring. 2 cr. Mr. Richter.

Weekly meetings for the presentation and discussion of papers upon assigned topics pertaining to mechanical engineering. Lect. 1.

13. **Machine Design.** 2 Q. Winter and spring. 6 cr. Prerequisite Mechanical Engineering 8. Mr. Therkelsen.

Elementary theory of machine design supplemented by applications in the drafting room. Straining actions in stressed machine members and frames, materials used and forms for strength, fastenings, friction, journals and design elements of mechanical transmitters of power. Lect. 2; lab. 1.

15. **Mechanical Laboratory.** 1 Q. Autumn. 3 cr. Prerequisite Physics 1. Mr. Therkelsen.

Calibration of instruments, calorimetry, indicator practice, steam, fuel and lubricating oils. Determination of power input, output and mechanical efficiency. Lect. 1; lab. 2.

15a. **Mechanical Laboratory.** 1 Q. Winter. 1, 2 or 3 cr. Prerequisite Mechanical Engineering 7. Fee \$1. Mr. Therkelsen.

Short course. Indicator practice; efficiency tests of boilers, pumps and electric power units.

18. **Thermodynamics.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisites Mathematics 4, Chemistry 1, Physics 1, 2. Mr. Richter.

Gases, saturated and superheated vapors and mixtures, cycle processes, flow of fluids through nozzles, and throttling processes. Heat engines and boilers. Lect. 5 and 2.

18a. **Heat Power.** 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 7. Mr. Richter.

Prime movers for central stations. Lect. 3.

20. **Mechanical Laboratory.** 1 Q. Winter. 2 cr. Prerequisites Mechanical Engineering 15, 18. Fee \$2. Mr. Therkelsen.

Exercises in valve setting. Fuel consumption tests of gasoline and oil engines. Tests of injectors, pumps and engines, etc. Lab. 2.

21. **Machine Work.** 1 Q. Autumn. 4 cr. Prerequisite Mechanical Engineering 2. Fee \$1; deposit \$2. Mr. Homann.

General shop work. Building complete machines. Lab. 3.

22. **Gas Power Engineering.** 1 Q. Autumn. 4 cr. Prerequisite Mechanical Engineering 13, 18. Mr. Therkelsen.

Performance and design of gas motors, gas producers and other gas machinery. Gas mixtures and their behavior within the engine cylinder. Method of governing. Types of engines. Lect. 4.

22a. **Gas Power.** 2 Q. Autumn and spring. 5 cr. Prerequisites Mechanical Engineering 15a, 18a. Mr. Therkelsen.

A brief discussion of the internal combustion engine cycles followed by study of commercial types of engines and auxiliaries. Methods of testing and American practice in rating internal combustion engines. Lect. 3; lab. 2.

23. **Engine and Turbine Design.** 2 Q. Autumn and winter. 8 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Therkelsen.

Cylinder valve and port design. Engine frame. Energy cycle of reciprocating parts. Crank shaft and fly wheel design. Governor energy cycle and design to accomplish given speed regulations. Nozzle and blade design. Stresses and strains in rotating discs and drums. Forms for strength. Lect. 2; lab. 2.

24. **Heating and Ventilation.** 1 Q. Spring. 2 cr. Prerequisite Mechanical Engineering 7. Mr. Richter.

Heating buildings by the various systems; ventilation with calculations for specific installations, specifications and estimate of costs. Lect. 2.

25. **Commercial Engineering.** 1 Q. Spring. 4 cr. Mr. Therkelsen.

General principles underlying the organization, management and operation of industrial establishments. Valuation of the physical properties of a plant. The public utility commission and public service corporations. The United States patent office. Inventions and their protection. Application for patents. Lect. 4.

26. **Mechanical Engineering of Steam Power Plants.** 1 Q. Winter. 4 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Therkelsen.

A study of modern mechanical equipment of steam power plants with reference to design factor magnitudes determining its selection. Principles underlying design of complete plant. Specifications as submitted to builders of equipment and to erectors of plant. Lect. 4.

27. **Machine Tool Work.** 2 Q. Winter and spring. 4 cr. Fee \$1; deposit \$2. Mr. Homann.

Work on lathe, milling machine and grinder; manufacture of reamers, drills, taps, mills and dies. Lab. 2.

28. **Mechanical Laboratory.** 1 Q. Autumn. 2 cr. Prerequisite Mechanical Engineering 15. Fee \$1; deposit \$2. Mr. Therkelsen.

Efficiency tests of heating, ventilating, compressed air, refrigerating and power plant equipment, steam and gas power plants and machinery. Lab. 2.

29. **Plant Design.** 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 26. Mr. Therkelsen.

An application of the principles taught in mechanical engineering 26 in the design of a power plant for a specific purpose. Lect. 1; lab. 2.

30. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Before graduating the student is required to present an accepted thesis involving an investigation of some problems related to mechanical engineering. Work will be done under the supervision of the head of the department, but the student will devise his own methods.

32. **Automobile Practice.** 1 Q. Autumn or winter or spring. 2 cr. Fee \$2. Mr. Homann.

Engines, carburetors, ignition and lighting systems, oiling and tires. Number in class will be limited. Lab. 2.

33. **Tractor Power.** 1 Q. Winter. 3 cr. Mr. Homann.

Steam, gasoline and oil tractors. Lab. 2.

34. **Machine Work.** 1 Q. Autumn. 2 cr. Fee \$1; deposit \$2. Mr. Homann.

General machine work, continuation of course in Mechanical Engineering 9. For electrical engineers. Lab. 2.

35. Advanced Mechanical Engineering. 2 to 5 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Richter.

An investigation and study of the application of the principles of thermodynamics and machine design in the solution of such energy transformer systems as are used in modern mechanical engineering practice.

36. Plumbing and Steam Fitting. 2 Q. Autumn and winter. 4 cr.

A study of modern plumbing equipment, valves, piping, conduits, connections, packing, etc., calculations to determine transmission losses in pipes, bends and valves for the purpose of determining pipe or conduit sizes. Lect. 2; lab. 2.

50. Engineering Lectures. 1 Q. Spring. 1 cr. Engineering Faculty.

Lectures on general engineering subjects dealing with the engineering profession and its development. Lect. 1.

College of Applied Science

The departments comprised in the College of Applied Science have a two-fold duty to perform.

(1) They give instruction and training in the fundamental sciences as applied in agriculture, engineering and home economics. A large and important part of the students' work in these major divisions of the institution is given in the science departments.

(2) They also offer several courses of instruction in which the main object is to prepare specialists in the various branches of the basic sciences. These courses also give an excellent general training and may be taken by those students of agriculture, engineering and home economics, who desire to give more attention to the fundamental and less to the more specialized branches of agriculture, engineering and home economics.

The courses of instruction in the College of Applied Science, each leading to the degree of Bachelor of Science, are as follows: 1, Botany and Bacteriology; 2, Chemistry; 3, Entomology and Zoology.

Recognizing that beginning students will be benefited by an opportunity to spend at least one year in the institution before committing themselves to a line of study to be followed, the work in the freshman year has been made much alike in courses 1, 2 and 3. During his first year the student takes up a considerable variety of studies and often learns for which line of work he is best adapted. At the opening of the sophomore year he can change courses within the same group without loss of time. Again, the freshman year in the agricultural course, listed elsewhere in the catalogue, is so much like the freshman year in the first three courses that usually a change in either direction can be made without inconvenience.

COURSE IN BOTANY AND BACTERIOLOGY

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Trigonometry and Logarithms, (Math. 8) or Elementary Analysis (Math. 16)	4		
General Botany (Bot. 1)		6	
Agricultural Physics (Phys. 1a)			6
Systematic Botany (Bot. 2)			5
Elective	5	3	4
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Invertebrate Zoology (Zool. 1)	6		
Human Physiology (Zool. 3)		6	
Economic Entomology (Ento. 4)			4
General Bacteriology (Bact. 12)	6		
Sanitary Bacteriology (Bact. 13)		3	
Microbiology (Bact. 14)			5
Elective	4	7	7
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

English Composition (Eng. 3)	2	2	2
Plant Pathology (Bot. 4)	6		
Plant Physiology (Bot. 3)			6
Embryology (Zool. 8)	3	3	
Organic Chemistry (Chem. 9)	5	5	5
Geology (Geol. 1)		4	
Elective	3	5	6

SENIOR YEAR

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Mycology (Bot. 5)			5
Organic Evolution (Zool. 9)			4
Thesis (Bot. 11)	5	5	5
Elective	11	11	2

COURSE IN CHEMISTRY

Options: (a) Agricultural Chemistry, (b) Food Chemistry, (c) Bio-Chemistry, (d) Industrial Chemistry.

FRESHMAN YEAR	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	6
Elementary Analysis (Math. 16)	4	4	4
Technical Lectures (Chem. 22)	1	1	1
Elective	4	4	4
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR	Autumn	Winter	Spring
Expository Composition (Eng. 2).....	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Qualitative Analysis (Chem. 2)	5		
Quantitative Analysis (Chem. 3)		5	5
Invertebrate Zoology (Zool. 1) or			
General Biology (Zool. 15)	6		
General Physics (Phys. 14)		5	5
Elective	5	6	6
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR	Autumn	Winter	Spring
Quantitative Analysis (Chem. 4)	4		
Organic Chemistry (Chem. 9)	5	5	5
Physical Chemistry (Chem. 19)		5	5
Engineering Chemistry (Chem. 12)			4
General Bacteriology (Bact. 12)	6		
Sanitary Bacteriology (Bact. 13)		3	
Elective	4	6	5

SENIOR YEAR	Autumn	Winter	Spring
English Composition (Eng. 3)	2	2	2
Economics (Econ. 3)	3	3	
Industrial Chemistry (Chem. 14)	5		
Electro Chemistry (Chem. 23)	5		
Water Analysis (Chem. 19)		4	
Physiological Chemistry (Chem. 11)			5
Seminar (Chem. 20)	1	1	1
Elective	3	9	11

COURSE IN ENTOMOLOGY AND ZOOLOGY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Trigonometry and Logarithms (Math. 8) or Elementary Analysis (Math. 16)	4		
General Botany (Bot. 1)		6	
Agricultural Physics (Phys. 1a)			6
Systematic Botany (Bot. 2)			5
Elective	5	3	4
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Invertebrate Zoology (Zool. 1)	6		
Human Physiology (Zool. 3)		6	
Economic Entomology (Ento. 4)			5
Organic Chemistry (Chem. 5)	6		
Agricultural Chemistry (Chem. 7)		6	
Plant Physiology (Bot. 3)			6
Elective	4	4	5
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

English Composition (Eng. 3)	2	2	2
General and Systematic Entomology (Ento 5)	3	3	
Vertebrate Zoology (Zool. 2)			6
General Bacteriology (Bact. 12)	6		
Advanced Economic Entomology (Ento. 6)		3	3
Geology (Geol. 1)		4	
Elective	8	7	8

SENIOR YEAR

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Embryology (Zool. 8)	3	3	
Organic Evolution (Zool. 9)			4
Thesis (Ento. 10)	3-5	3-5	3-5
Elective	8	8	7

Note—Students who intend to make professional use of Entomology or Zoology will be required before graduation to have a reading knowledge of French or German.

Courses of Instruction.

BOTANY AND BACTERIOLOGY.

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

Botany and bacteriology are among the sciences most fundamental to agriculture. Through botany we learn of the different kinds of plants, their relationship, structure, nutrition, growth and reproduction, and of the fungus parasites responsible for many plant diseases. Through bacteriology, we learn of plant and animal diseases and of important chemical changes brought about by micro-organisms in soil, dairy products, silage and other kinds of organic matter. While botany and bacteriology have other aspects besides those relative to agriculture the latter are especially emphasized here.

The four-years course leading to a degree in botany and bacteriology has two major purposes aside from its disciplinary value. First, to train men for professional career in botany, plant pathology, agricultural bacteriology and related subjects; second to prepare students for the study of medicine in other institutions. With a judicious selection of electives this is a very good pre-medical course.

Every effort is made to maintain in this course the high standard found in similar courses of undergraduate work in the larger universities. A number of the best students get the additional opportunity of working in the laboratories of the experiment station where in addition to making part of their expenses they can become familiar with the methods used in research work in this department.

This course is characterized by a liberal amount of work in the other sciences especially chemistry and enough elective space for courses in applied agriculture, language, etc.

1. **General Botany.** 1 Q. Winter. 6 cr. Fee \$2; deposit \$2. Mr. Swingle, Mr. Jennison.

Survey of the entire plant kingdom and under each group of plants is discussed the structure, physiology, evolution, life history and economic significance of representative examples. Lect. 3; lab. 3.

2. **Systematic Botany.** 1 Q. Spring. 5 cr. Prerequisite Botany 1. Fee \$3. Mr. Swingle, Mr. Jennison.

Principles underlying classification and application of principles in laboratory and field; especially Montana plants. Lect. 2; lab. 3.

3. **Plant Physiology.** 1 Q. Spring. 6 cr. Prerequisites Botany 1, Physics 1a, Chemistry 5. Fee \$3; deposit \$3. Mr. Jennison.

Nutrition, growth, reproduction and movement in plants especially the higher forms. Lect. 3; lab. 3.

4. **Plant Pathology.** 1 Q. Autumn. 6 cr. Prerequisites Botany 1, Bacteriology 12. Fee \$3. Mr. Jennison.

Plant disease, including the relations of host and parasites, immunity and susceptibility of host and nature of diseases not caused by parasites. Lect. 3; lab. 3.

5. **Mycology.** 1 Q. Spring. 5 cr. Prerequisite Botany 1. Fee \$3. Mr. Jennison.

A comparative study of the structure, physiology and classification of fungi. Lect. 2; lab. 3.

11. **Thesis.** Credits variable. Fee \$1; deposit \$4. Mr. Swingle, Mr. Jennison.

Open to seniors in the botany and bacteriology course, and to others who have had sufficient preparation.

12. **General Bacteriology.** 1 Q. Autumn. 6 cr. Prerequisites Chemistry 1, one course in Botany or Zoology. Fee \$4; deposit \$3. Mr. Swingle, Mr. Jennison.

Structure, physiology and classification of bacteria, their growth in nutrient media and methods of bacteriology technique. Relation of bacteria to agriculture, to human and animal pathology to the arts and industries. Lect. 3; lab. 3.

13. **Sanitary Bacteriology.** 1 Q. Winter. 3 cr. Prerequisite Bacteriology 12. Mr. Swingle.

Treating of infectious diseases. Sources and modes of infection for self protection and the protection of others. Lect. 3.

14. **Microbiology of Waters and Foods.** 1 Q. Spring 5 cr. Prerequisite Bacteriology 12. Fee \$4; deposit \$3. Mr. Swingle, Mr. Jennison.

A study of micro-organisms in relation to the sanitary qualities of waters and foods. Foods will be studied on even years and waters on odd years. Lect. 2; lab. 3.

15. **Elementary Bacteriology.** 1 Q. Spring. 5 cr. Fee \$3; deposit \$2. Mr. Swingle, Mr. Jennison.

Beginning nurses course. Microscopical and cultural studies of organisms; laboratory tests for diagnosis; bacteria in relation to infectious diseases. Lect. 2; lab. 3.

CHEMISTRY.

PROFESSOR W. M. COBLEIGH. ASSISTANT PROFESSOR, E. J. QUINN.
INSTRUCTOR, E. C. HYTREE. ASSISTANT, GLADYS RITZ.

The applications of chemistry to the various phases of agriculture, to home economics, to engineering and to many modern industries make this science an important one in a technical school.

A four years course in chemical engineering is offered by the division of engineering.

The chemistry course offered by the division of science has four options as outlined below. In this course a large number of electives are offered each year, in order that the student may adapt his training to one of the following special fields. The student must elect one of the following options:

a. Agricultural Chemistry. Electives should be chosen from the various sub-courses in agriculture, biology, chemistry, and language. This will give the student an excellent training in scientific agriculture and prepares for positions in agricultural colleges and experiment stations, and the government service.

b. Food Chemistry. Electives should be chosen from home economics, biology, chemistry and language.

c. Biochemistry. Electives should be taken mainly from biology, chemistry, and language. This course prepares students for positions in state and municipal food laboratories, in water purification works and in sewage disposal plants.

d. Industrial Chemistry. In this option the electives should be chosen from sub-courses in mathematics, physics and engineering. This course prepares students for positions as chemists in the laboratories of the manufacturing industries.

1. General Chemistry. 3 Q. Autumn, winter and spring. Continuous. 18 cr. Fee \$5; deposit \$3. Mr. Cobleigh, Mr. Hytree and assistants.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds, and elementary qualitative analysis. Lect. 4; lab. 2.

2. Qualitative Analysis. 1 Q. Autumn. 5 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Quinn.

The course is presented from the standpoint of modern theories of chemistry. Lect. 4; lab. 2.

3. Quantitative Analysis. 3 Q. Autumn, winter and spring. Continuous. 12 or 15 credits. Prerequisite Chemistry 1 or 2. Fee \$4; deposit \$4. Mr. Quinn.

Theory and technique of the methods of analytical chemistry and chemical calculations. Lect. 2; lab. 2. Lect. 2; lab. 3.

4. Quantitative Analysis. 3 Q. Autumn, winter and spring. Continuous. 12 or 15 cr. Prerequisites Chemistry 3, 5. Fee \$4; deposit \$4.

A continuation of chemistry 3. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 2. Lect. 2; lab. 3.

5. Agricultural Organic Chemistry. 1 Q. Autumn. 6 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Hytree.

Compounds of the aliphatic and aromatic series and organic materials of interest to students of agriculture and home economics. Lect. 4; lab. 2.

7. **Agricultural Chemistry.** 1 Q. Winter. 6 cr. Prerequisite Chemistry 5. Fee \$6; deposit \$4. Mr. Quinn.

Composition and reaction of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of feeding stuffs and of dairy products and problems of farm sanitation. Lect. 4; lab. 2.

8. **Food Chemistry.** 1 Q. Spring. 6 cr. Prerequisite Chemistry 5. Fee \$4; deposit \$4. Mr. Cobleigh.

Composition of foods, food production and preservation, food legislation and inspection. Lect. 4; lab. 2.

9. **Organic Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Hytree.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

11. **Physiological Chemistry.** 1 Q. Spring. 5 cr. Prerequisite Chemistry 5. Fee \$4; deposit \$4. Mr. Hytree.

Functions of fats, carbohydrates, protein, and salts in nutrition together with a study of the chemistry of digestion and metabolism. Lect. 3; lab. 2.

12. **Engineering Chemistry.** 1 Q. Autumn or spring. 4 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel, and copper. Qualitative and approximate quantitative examination of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 2.

14. **Industrial Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 2, 3, 9. Fee \$4; deposit \$4. Mr. Cobleigh.

The application of chemistry to the industries, including operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. The laboratory work in the spring quarter is taught from the viewpoint of chemical engineering. Lect. 3; lab. 2.

17. **Fuel Analysis.** 1 Q. Spring. 3 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Production and analysis of solid, liquid and gaseous fuels, illuminating gas, and lubricating oils. Lect. 1; lab. 2.

18. **Water Analysis.** 1 Q. Winter or spring. 4 cr. Prerequisite Chemistry 1, 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewage, and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. **Physical Chemistry.** 2 Q. Winter and spring. 10 cr. Prerequisite Chemistry 3. Fee \$2; deposit \$2. Mr. Hytree.

Theoretical chemistry, including stoichiometry, radio-activity, the electron theory, the gas laws, kinetic theory of gases, liquids, solids, colloids, osmotic pressure, theory of solution and the phase rule. Lect. 3; lab. 2.

20. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hytree.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors where the topics are discussed. Lect. 1.

21. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hytree.

Students in the chemistry course may in the senior year prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab. 2.

22. **Technical Lectures.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hytree.

Serves the purpose of so-called orientation lectures designed to give the freshman in chemistry or chemical engineering an appreciation of the field of chemistry in practical affairs, and to give him a more adequate outlook on the training required by professional chemists.

23. **Electro Chemistry.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 19. Fee \$2; deposit \$2. Mr. Hytree.

Electro chemistry, including the following topics:

Electrical conductance, equilibrium, hydrolysis, electromotive force, electrolysis, and polarization.

ENTOMOLOGY AND ZOOLOGY.

PROFESSOR, R. A. COOLEY. ASSISTANT PROFESSOR, M. H. SPAULDING.

Taken as a whole the courses in this department are primarily designed to give training in the zoological branches as they are applied in horticulture, agronomy, animal husbandry, general agriculture, and home economics. They form a basis for an understanding of the various phases of the development of life and the problems of evolution. They throw light on the problems of social science, and are well designed for purposes of general education.

The department is well equipped with the necessary microscopes, microtomes, photographic apparatus and dark rooms and miscellaneous equipment which permit all courses listed to be given in a thorough manner.

The various animal groups are well represented in the collections. In the museum room are about five hundred skins of mammals and birds, while among the study materials is an unusually full series of marine and fresh water invertebrates.

The insect collections are especially large and useful. Many thousands of pinned specimens are arranged in the cabinets and these together with the microscopical slides and alcoholic materials constitute one of the best insect collections in the West.

The library contains a very valuable accumulation of books and pamphlets dealing with zoological subjects. It is especially strong in entomological literature. The more important scientific journals of this country and others are regularly received and the library has more or less complete sets of back numbers bound and placed on the shelves.

1. Invertebrate Zoology. 1 Q. Autumn. 6 cr. Fee \$3. Mr. Spaulding.

Invertebrate animals, including their morphology, development, habits, economical or popular interest and classification. Lect. 3; lab. 3.

2. Vertebrate Zoology. 1 Q. Spring. 6 cr. Prerequisite Zoology 1. Fee \$3. Mr. Spaulding.

Vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Elective to all students. Lect. 3; lab. 3.

3. Human Physiology and Anatomy. 1 Q. Winter. 6 cr. Prerequisite Zoology 1 or 15. Fee \$3. Mr. Spaulding.

Lectures and demonstrations presenting the main principles of animal physiology, the human body being used as the type, augmented by laboratory work in mammalian anatomy. Lect. 3; lab. 3.

4. Economic Entomology. 1 Q. Spring. 5 cr. Prerequisite Zoology 1. Fee \$2. Mr. Cooley.

Anatomy, metamorphosis and classification of insects; study of the various orders and of the principle families with particular reference to the species of economic importance. Lect. 3; lab. 2.

5. General and Systematic Entomology. 2 Q. Autumn and winter. 3 cr. Prerequisite Entomology 4. Fee \$2. Mr. Cooley.

Morphology and classification of insects with some consideration of physiology, development, and adaptations. Lect. 1; lab. 2. Lect. 2; lab. 1.

6. Advanced Economic Entomology. 2 Q. Winter and spring. 3 cr. Prerequisite Entomology 4. Fee \$2. Mr. Cooley.

Insect pests and insect control. Lect. 1; lab. 2.

7. Advanced Entomology. 3 Q. Autumn, winter and spring. Continuous. 6 to 10 cr. Prerequisites Entomology 4, 5, 6. Fee \$2. Mr. Cooley.

Individual instruction to fit the students' needs, including systematic, economic, biological, and library work.

8. **Embryology.** 2 Q. Autumn and winter. 6 cr. Prerequisite Zoology 2 or 3. Fee \$3. Mr. Spaulding.

Formation and growth of tissues in the vertebrate body, based chiefly on a study of the chick, but including consideration of the development in the mammalian. Lect. 1; lab. 2.

9. **Organic Evolution.** 1 Q. Spring. 4 cr. Mr. Spaulding.

Evolution theories and their present status; also heredity, variation, natural and artificial selection, adaptations, etc. Lect. 4.

10. **Thesis.** Credits variable, not to exceed 5. Fee \$2 to \$10. Mr. Cooley or Mr. Spaulding.

Seniors in this department and seniors from other courses, who have had sufficient previous training, may elect this course.

11. **Economic Zoology.** 1 Q. Autumn. 3 cr. Prerequisite Zoology 1 or 2. Mr. Spaulding.

Discussion of vertebrates of economic importance and devoted chiefly to mammals and birds. Lect. 3.

12. **Physiology and Hygiene.** 1 Q. Winter. 6 cr. Fee \$3. Mr. Spaulding.

Graduate nurses' course. Dealing with the more important phases of physiology and hygiene supplementing the work already taken, with laboratory work with living tissues. Lect. 3; lab. 3.

13. **Parasitology.** 1 Q. Spring. 4 cr. Prerequisite Zoology 1. Fee \$3. Mr. Spaulding.

The structure, life history and habits of the parasitic groups of animals. Lect. 2; lab. 2.

14. **Insect Drawing.** 3 Q. Autumn, winter and spring. Continuous. 2 or 3 cr. Prerequisite Entomology 4. Fee \$2 or \$3. Mr. Cooley.

Instruction in professional drawing of insects for illustrating publications. Lab. 3.

15. **General Biology.** 1 Q. Spring. 6 cr. Fee \$3. Mr. Spaulding.

The fundamental principles of plant and animal life, planned particularly for the needs of students in home economics. Lect. 3; lab. 3.

College of Household and Industrial Arts.

The courses offered in the College of Household and Industrial Arts are: Applied Art, Home Economics and Secretarial Work.

The purpose of each of the courses is indicated by its title. The industrial application of the work is emphasized in each course. The applied art course and secretarial work are open to both men and women. Several subjects taught in departments not represented in the College of Household and Industrial Arts are open to election by students on consent of their adviser.

COURSE IN APPLIED ART

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
German (German 1 or 3) or			
French (French 1)	4	4	4
Freehand Drawing (Art 1)	2		2
Clothing (H. E. 11)	3	3	
Design (Art 7)	2		3
Perspective (Art 15)	2		
Painting (Art 2)	2	2	3
General Botany (Bot. 1)		6	
Foods (H. E. 1a)			3
Physical Education (Phys. Ed. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
German (German 2) or			
German (German 5 and 6) or			
French (French 2)	4	4	4
History of Art (Art 6)	3	3	3
Foods (H. E. 1b)	3		
Human Physiology and Anatomy (Zool. 3)		6	
Freehand Drawing (Art 1a)	2		3
Painting (Art 2a)	2		
Handicraft (Art 10-11-12-13)			4
Historic Ornament (Art 7a)	2	2	2
Physical Education (Phys. Ed. 2)	1	1	1

JUNIOR YEAR

English Literature (Eng. 10)	3	3	3
Painting (Art 2b)	4		4
Household Physics (Phys. 9)		5	
Advanced Design (Art 7b)	2	2	2
Freehand Drawing (Art 1b)	3		3
Composition (Art 16)		3	
Handicraft (Art 10-11-12-13)	2	2	2
Medieval History (Hist. 2)	3	3	3
Elective	2		2

SENIOR YEAR

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			4
Psychology (Ed. 1)	3		
Modern Drama (Eng. 6)	2	2	2
Handicraft (Art 10-11-12-13)	2	2	2
Advanced Design (Art 7c)	3	3	3
Thesis (Art 19)	4	4	4
Elective	2	5	4

COURSE IN HOME ECONOMICS

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
General Biology (Biol. 15)			6
Design (Art 7)	2		3
Textiles (H. E. 13)		2	2
Clothing (H. E. 11)	3	3	
Foods (H. E. 1a)	3	3	
Dressmaking (H. E. 12)			3
Physical Education (Phys. Ed. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Organic Chemistry (Chem. 5)	6		
Food Chemistry (Chem. 8)			6
Human Physiology (Zool. 3)		6	
Household Physics (Phys. 9)		5	
Foods (H. E. 16)	3		
Foods (H. E. 2)			4
The House (H. E. 3)		2	
House Planning (A. E. 13)			2
General Bacteriology (Bact. 12)	6		
Sanitary Bacteriology (Bact. 13)		3	
Elective			4
Physical Education (Phys. Ed. 2)	1	1	1

JUNIOR YEAR

House Furnishing (Art 8b)	3		
Costume Design (Art 8)	5		
Advanced Dressmaking (H. E. 14)			3
Physiological Chemistry (Chem. 11)			5
Foods (H. E. 4)		3	
Quantitative Analysis (Chem. 3)	3	3	3
Home Nursing (H. E. 9)		2	
Elective	7	10	7

SENIOR YEAR

Household Management (H. E. 7)			4
Home Problems (H. E. 10)		4	
Seminar (H. E. 5)			3
Dietetics (H. E. 6)	6		
Extension Course (H. E. 8)		4	
Advanced Textiles (H. E. 18)			3
Psychology (Ed. 1)	3		
Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Elective	7	8	6

COURSE IN SECRETARIAL WORK

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Clothing (H. E. 11b) or			
Drawing and Commercial Lettering (M. E. 1b)			3
Modern Language	4	4	4
European History (Hist. 1)	3	3	3
Typewriting (Sec. 3)	1	1	1
Shorthand (Sec. 1)	1	1	1
Business English and Correspondence (Sec. 3)			3
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Modern History (Hist. 7)	2	2	2
Principles of Accounting (Sec. 9)	3	3	3
Modern Language	4	4	4
Shorthand (Sec. 2)	2	2	2
Typewriting (Sec. 4)	2	2	2
Commercial Law (Sec. 8)	3	3	
Office Practice (Sec. 6)			3
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

19th Century Literature (Eng. 10)	3	3	3
Industrial History (Hist. 10)	3	3	3
Economics (Econ. 3)	3	3	3
Principles of Business (Sec. 14)	3	3	
Elementary Analysis (Math. 16)	4	4	
Theory of Investments (Math. 15)			3
Elective	3	3	7

SENIOR YEAR

Contemporary Literature (Eng. 14)	3	3	3
Economics of Business	2	2	
American History (Hist. 5)	3	3	3
Business Statistics (Sec. 20)	2	2	2
Sociology (Soc. 4)			3
Psychology (Ed. 1)	3		
Salesmanship and Business Efficiency (Sec. 16)		3	
Elective	5	5	7

TWO-YEARS COURSE IN SECRETARIAL WORK.

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Clothing (H. E. 11b) or			
Drawing and Commercial Lettering (M. E. 1b)			3
Modern Language	4	4	4
European History (Hist. 1)	3	3	3
Typewriting (Sec. 3)	1	1	1
Shorthand (Sec. 1)	1	1	1
Business English and Correspondence (Sec. 3)			3
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Modern History (Hist. 7)	2	2	2
Principles of Accounting (Sec. 9)	3	3	3
Modern Language	4	4	4
Shorthand (Sec. 2)	2	2	2
Typewriting (Sec. 4)	2	2	2
Commercial Law (Sec. 8)	3	3	
Office Practice (Sec. 6)			3
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

Courses of Instruction.

APPLIED ART.

ASSISTANT PROFESSOR, LANA BALDWIN. INSTRUCTORS, MURIEL MOORE, MILDRED BERRY.

The applied art course is outlined to give a thorough training in drawing and in the use of color. The object of the study being to prepare students for studio work as designers, craftsmen, or decorators, and also to prepare them to teach drawing and handicraft in elementary, grammar and high schools. The course includes the study of line, form, color, historic ornament, principles of design and composition and technical methods in applied design. It insures a broad foundation of art culture and skill which will enable students to make practical use of their training. Exceptional facilities are offered for the study of design and composition and the course is strengthened by the many phases of related art work. Every effort is made to teach drawing. The pupil is then encouraged to follow any line of art work for which he seems the best fitted; applied design, handicraft work or teaching.

1. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$.50. Miss Moore.

Drawing from the cast in charcoal pencil, or pen and ink. Lab. 2 to 4.

1a. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$.50. Miss Moore.

Continuation of Art 1. Lab. 2 to 4.

1b. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$.50. Miss Moore.

Continuation of Art 1. Lab. 2 to 4.

2. **Painting.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Prerequisite Art 1. Fee \$.50. Miss Berry.

Water colors, oils and tempera. Work from nature and still life. Lab. 2 to 4.

2a. **Painting.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$.50. Miss Berry.

Continuation of Art 2. Lab. 2 to 4.

3. **Architectural Drawing** 1 Q. Spring. 4 cr. Fee \$.50. Miss Moore.

Drawing from still life and casts. Study of architectural details, and sketching from nature. Work executed in pencil, pen and ink, and charcoal. Lab. 4.

3a. Architectural Drawing. 3 Q. Autumn, winter and spring. Continuous. 5 cr. Prerequisite Art 3. Fee \$.50. Miss Berry.

Continuation of Art 3. Problems in composition and design. Work executed in pencil, charcoal, wash, and color. Lab. 3.

4. Drawing from Nature. 1 Q. Autumn, or winter, or spring. 2 cr. Fee \$.50. Miss Moore.

Pencil, pen and ink, wash and color. Intended especially for students in biology. Lab. 2.

6. History of Art. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Berry.

Intended especially for students in design. Historic ornament and the classic styles as exemplified in painting, sculpture and architecture. (Not offered in 1918-1919.) Lect. 3.

7. Design. 2 Q. Autumn and spring. 5 cr. Fee \$.50. Miss Berry.

Applied design and use of water colors. Students submit original designs. Lab. 2. Lect. 1; lab. 2.

7a. Historic Ornament. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite Art 7. Fee \$.50. Miss Moore.

Historic ornament with analysis of historic examples of design. Original problems executed in black and white and in color. Lab. 2.

7b. Advanced Design. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Moore.

Original designs for commercial purposes executed to meet the requirements and conditions of reproduction. Lab. 2.

7c. Advanced Design. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Fee \$.50. Miss Berry.

Continuation of 7b. Lab. 3.

8. Costume Design. 1 Q. Autumn. 5 cr. Fee \$3. Miss Moore.
Study of design, color and texture suitable for various types of individuals and occasion. Practical application to dress. Lect. 3; lab. 2.

8a. Embroidery Design. 1 Q. Spring. 2 cr. Fee \$.50. Miss Moore.

Theory of color and design; original designs for embroidery. Lab. 2.

8b. House Furnishing. 1 Q. Autumn. 3 cr. Fee \$.50. Miss Baldwin.

Color, line and form as applied to house furnishings. Lect. 1; lab. 2.

8c. Decorative Periods. 1 Q. Winter. 3 cr. Prerequisite Art 8b. Fee \$.50. Miss Baldwin.

Advanced work in interior decoration. Decorative styles and their adaptation to modern uses. Original designs for interiors executed in color. Lect. 1; lab. 2.

9. China Design. 1 Q. Autumn, or winter, or spring. 2 cr. Fee \$.50. Miss Moore.

Applied design for decoration of china; study of color. Lab. 2.

10. **Painting on China.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee \$2; deposit \$4. Miss Moore.

China is fired in the studio. Lab. 2.

11. **Leather.** 1 Q. Autumn, or winter, or spring. 2 cr. Prerequisite Art 7. Fee \$3. Miss Baldwin.

Tooling, modeling, and embossing; also use of dyes and stains for leather. Lab. 2.

Owing to the scarcity of materials due to the war, this course will not be offered until further notice is given. A substitute course in decorative painting will be offered.

12. **Jewelry.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$3. Miss Baldwin.

Making of simple and unique jewelry in gold, silver, and in copper. Sawpiercing, enameling, repousse and the setting of semi-precious stones. Lab. 2 to 4.

13. **Metal.** 1 Q. Winter. 2 to 4 cr. Fee \$3. Miss Baldwin.

Work in copper, brass, and silver. Raising, sawpiercing, etching, hard and soft soldering and riveting. Given alternate years, 1919-1920. Lab. 2 to 4.

Owing to the scarcity of materials due to the war, this course will not be offered until further notice is given. A substitute course in decorative painting will be offered.

14. **Basketry.** 1 Q. Winter. 2 cr. Fee \$3. Miss Baldwin.

Making of baskets of reeds and raffia and other suitable materials. Dyes and dyeing baskets. Use of native materials in original work in basketry. Lab. 2.

15. **Perspective.** 1 Q. Autumn. 2 cr. Fee \$.50. Miss Moore.

Principles of angular and parallel view perspective taught by means of freehand sketches and drawings. Work executed in pencil, pen and ink, wash and color. Lect. 1; lab. 1.

16. **Composition.** 1 Q. Winter. 2 cr. Fee \$.50. Miss Moore.

Art structure as a means of expression. Original compositions in light and dark, line and color. Lect. 1; lab. 1.

17. **Practice Work in Teaching.** 1 Q. Autumn or winter or spring. 2 cr. Miss Baldwin.

Teaching drawing, painting, design and handicrafts.

18a. **Methods.** 1 Q. Winter. 3 cr. Fee \$.50. Miss Baldwin.

Methods of teaching drawing, painting and design. Lesson plans and materials. Lect. 2; lab. 1.

18b. **Methods.** 1 Q. Spring. 3 cr. Fee \$.50. Miss Baldwin.

Methods of teaching the handicrafts; metal, jewelry, leather, basketry, wood block painting, and stenciling. Lesson plans. Materials and equipment. Lect. 2; lab. 1.

19. **Thesis.** 3 Q. Autumn, winter and spring. 12 cr. Fee \$1 to \$5. Miss Baldwin.

HOME ECONOMICS

PROFESSOR, ALBA BALES. ASSISTANT PROFESSORS, CARLOTTA FORD, EDITH FRANKS, CECILE VAN STEENBERG. INSTRUCTOR, VICTORIA JORDAN.

The department of home economics offers the following courses designed to meet the needs of students:

1. Those students who wish to teach home economics in the secondary schools.
2. Those students who desire a liberal education which shall include definite training in household arts and sciences.
3. Those students who wish to specialize in some phase of household science or art which will prepare them for professions other than teaching or home making.
4. Those students who wish to prepare for field work or extension work.

The students who desire to prepare themselves to teach home economics will complete the Teachers' Course. Those who desire to specialize in some phase of household arts or science, or prepare for extension work, will include beyond the work of the freshman and sophomore years of the Teachers' Course, advanced courses in chemistry, foods, and textiles suggested by the faculty, which will prepare them to enter commercial pursuits in textiles, to take a position as dietitian, instructional manager, or professional housekeeper, or to enter the extension field.

1a. Foods. 2 Q. Autumn and winter. 6 cr. Fee \$2.50. Miss Franks.

This course deals with the principles involved in cookery processes and a thorough study of food principles and food composition.

Students who have had two years' work in cookery in a good high school are scheduled in a separate section and are given more advanced work. Those students may be excused from Course 1b in the sophomore year if it is thought advisable by the instructors.

1b. Foods. 1 Q. Autumn. 3 cr. Fee \$2.50. Prerequisites Chemistry 1, Home Economics 1a. Miss Franks.

This course deals with the more complex cookery processes and development of technique and cookery principles involved in the more advanced courses in foods.

2. Food Studies. 1 Q. Spring. 4 cr. Fee \$3. Prerequisites Home Economics 1, Chemistry 5, Zoology 3. Miss Ford.

Application of the science underlying the selection and preparation of foods. The dishes prepared illustrate the scientific principles involved.

3. **The House.** 1 Q. Winter. 2 cr. Should be accompanied by Architectural Engineering 7. Miss Jordan.

The object of this course is to develop in the student standards of judging housing problems as related to the family needs, from the standpoint of economics, architecture, and site. Lect. 3.

4. **Food Economics.** 1 Q. Winter. 3 cr. Fee \$4. Miss Franks.

Planning family meals relative to the nutrition and cost. Serving of various types of meals. Open to students of junior standing. Lab. 2; lect. 1.

4a. **Food Preservation.** 1 Q. 3 cr. Fee \$1. Miss Franks.

The theory, equipment, and methods of this course will be given in one lecture per week. Outlines for practical work are given the students who do the practical work as a summer project at their homes during the summer vacation.

5. **Seminar.** 1 Q. Spring. 3 cr. Prerequisites Home Economics 6, Chemistry 11, Bacteriology 12, Physics 9. Miss Ford and Departmental Faculty.

Students will read abstract articles from current magazines and books. Two papers will be required. Meetings weekly.

6. **Dietetics.** 1 Q. Autumn. 6 cr. Fee \$4. Prerequisites Home Economics 2, Chemistry 11, Bacteriology 12. Miss Ford.

Human nutrition and metabolism, the relation of food to health and disease, the construction and preparation of dietaries. Lect. 3; lab. 3.

7. **Household Management.** 2 Q. Winter and spring. 4 cr. Fee \$.50. Miss Bales, Miss Jordan, Miss Franks.

This course includes a study of the family income, cost of living, household accounts, problems of domestic service, methods of house-keeping and economic food studies. Required of seniors in home economics. Lab. 3; lect. 3.

During this course the students spend 12 weeks in the practice house.

7a. **Marketing and Accounts.** 2 Q. Winter and spring. 2 cr. Miss Jordan.

Purchasing food and equipment for the household. Reducing waste in marketing and storing. Keeping the household accounts in connection with the practice house. Lect. 2.

7b. **Domestic Laundering.** 2 Q. Winter and spring. 4 cr. Miss Franks.

Principles and processes included in laundry work; equipment and materials needed; care of clothing as connected with laundry problems. Lect. 1; lab. 1.

8. **Extension Course.** 1 Q. Winter. 6 cr. Fee \$3. Open to seniors in Home Economics. Miss Rowe, Miss Jordan, Miss Ford.

Special methods in field work. Presentation of demonstrations and making outlines for field work. Students will do some field work under supervision of the extension staff. Lect. 2; lab. 2.

9. **Home Nursing.** 1 Q. Winter. 2 cr. Open to juniors in Home Economics. Given by a graduate nurse.

A study of the care of sick in the home, sick room, medicine cases, and nurses equipment. One lecture and one demonstration weekly.

10. **Home Problems.** 1 Q. Winter 4 to 6 cr. Deposit \$.50 to \$6. Miss Bales, Miss Ford, Miss Van Steenberg.

Individual work is required. The student is given opportunity to carry on original or suggested investigation in food work, or along economic lines pertaining to some phase of the home. Open to seniors only.

11. **Clothing.** 2 Q. Autumn and winter. 6 cr. Fee \$2. Miss Van Steenberg.

Intensive work on hand and machine sewing, use and alterations of patterns, and subject matter for elementary and secondary schools is emphasized. Lect. 1; lab. 1.

Note—Where necessary to strengthen the technic in sewing, summer projects will be assigned to be done during the vacation, between the freshman and the sophomore years.

11b. **Clothing.** 1 Q. Spring. 3 cr. Fee \$3. Miss Van Steenberg.

This course is designed to meet the needs of students who come from high schools where good courses in sewing have been completed. If the student shows proficiency in technique after two or three weeks' trial on garment making, advanced projects will be taken up. Lect. 1; lab. 2.

11b. **Clothing.** 1 Q. Spring. 3 cr. Fee \$3. Miss Van Steenberg.

This course is designed specially for the business woman. Garment making, mending, choosing materials, and a study of business woman's dress. For secretarial students.

12. **Dressmaking.** 1 Q. Spring. 4 cr. Fee \$1. Prerequisites Home Economics 11. Miss Van Steenberg.

Adapting standard commercial patterns to elementary dress design, and construction. Lab. 2.

13. **Textiles.** 1 Q. Winter. 3 cr. Fee \$1. Miss Van Steenberg.

A study of textile fibers, structure and properties. This course develops judgment in selection of textile fabrics for the house and for clothing. Lect. 1; lab. 2.

14. **Advanced Dressmaking.** 1 Q. Spring. 3 cr. Fee \$1. Prerequisites Home Economics 11, 13. Miss Van Steenberg.

Economic problems of a wardrobe, and the making of silk and wool garments. Lect. 1; lab. 2.

16. Draping and Designing. 1 Q. 3 cr. Fee \$1.

Study of types, experimenting in line and color and perfecting of technical method, in tailoring, afternoon and evening gowns. Open to juniors and seniors in home economics. Lect. 1; lab 2.

17. Millinery. 1 Q. Spring. 3 cr. Fee \$2. Miss Van Steenberg.

Methods in construction of various types of hat frames; use and renovation of old materials. Open to juniors. Lect. 1; lab. 2.

17a. Advanced Millinery. 1 Q. Autumn. 3 cr. Fee \$2. Miss Van Steenberg.

Advanced work in hat construction with fall millinery problems. Special work with making of trimmings. Open to juniors and seniors. Lect. 1; lab. 2.

18. Advanced Needlework and Housecraft. 1 Q. Spring. 3 cr. Fee \$2.

This course deals with useful decorative stitches and their application to clothing and household textiles. Lab. 3.

19. Therapeutic Cookery. 1 Q. Winter. 2 cr. Fee \$1. Miss Ford.

The food requirements of abnormal cases. Preparation of dietaries. Setting the tray. Lect. 1; lab. 1.

20. Experimental Cookery. 1 Q. 3 cr. Fee \$2. Miss Ford.

This course affords an opportunity for quantitative experimental work in the field of cookery. Lect 1; lab. 2.

22. Child Care and Training. 1 Q. 2 cr. Miss Bales.

A study of the mental and physical developments of the child and those influences which promote normal growth and health. Lect. 2.

23. Dietetics. 1 Q. Winter or spring. 3 cr. Prerequisite Home Economics 6. Fee \$4. Miss Ford.

Special attention is given to the study of recent advances in the science of nutrition and to training for specialized work in the field of nutrition. Lect. 2; lab. 1.

SECRETARIAL STUDIES

PROFESSOR, R. O. WILSON. ASSISTANT PROFESSOR, M. J. EDWARDS.
INSTRUCTOR, THEDA JONES.

The course in Secretarial work requires fifteen units of preparation and extends through four years. The technical work is planned to be directly applicable to business, and broad enough to serve as a basis for such positions as private secretary, office manager, etc.

The course includes a thorough grounding in English, and at least one modern language—French or Spanish, together with work in science, history, and social science. Women may elect some work in home economics. The technical work includes business procedure, office management and practice, business law, principles of accounting, principles underlying business activities, business statistics, shorthand and typewriting.

The degree Bachelor of Science is conferred upon students who have completed satisfactorily the prescribed four-years college course in secretarial work.

The two-years secretarial course is intended for those who cannot take the time to complete a four-years course. The completion of a high school or its equivalent is required for entrance.

1. **Shorthand.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Jones.

Fundamental principles of shorthand practice in word building, phrasing and dictation. Lect. 4.

2. **Shorthand.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Jones.

Practice in writing letters, legal papers, testimony, and miscellaneous matter. Students who take this course will also take Secretarial 4. Lect. 3.

3. **Typewriting.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Fee \$1. Miss Jones.

Use and care of typewriters. Exercises for the development of proper wrist and finger movements, and for the mastery of the key board. Practice in letter writing and the use of carbon. Lab. 4.

4. **Typewriting.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee \$. 50. Miss Jones.

Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; practice in the use of the mimeograph. Students who take this course will also take Secretarial 2. Lab. 3.

5. **Business English and Correspondence.** 1 Q. Spring. 3 cr. Mr. Wilson.

A practical course in business correspondence. Lect. 3.

6. **Office Practice.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Edwards.

Practice with various kinds of office appliances and equipment, such as adding machines, addressing machines, filing, etc. Lect. 1; lab. 1.

7. **Economics of Business.** 2 Q. Autumn and winter. 6 cr. Mr. Wilson.

This course offers a general survey of the principles underlying business activities. Lect. 3.

8. **Commercial Law.** 2 Q. Autumn and winter. 6 cr. Mr. Edwards.

Students will be required to familiarize themselves with the rights and liabilities of parties to common business transactions, as contracts, sales, deeds, mortgages; and with the drawing up and the validity of commercial paper and contracts. Text and cases. Lect. 3.

9. **Principles of Accounting.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Edwards.

Principles underlying accounting in general. Laboratory exercises. Lect. 1; lab. 2.

14. **Principles of Business.** 1 Q. Spring. 4 cr. Mr. Edwards.

A treatment of business as a science, as a group of activities governed by laws and rules, whose relation to the other sciences is intimate. Consideration of scientific methods of financing and management as they may be applied to business. Analysis of financial statements. Lect. 4.

16. **Salesmanship and Business Efficiency.** 1 Q. Autumn. 3 cr. Mr. Edwards.

A study of the fundamental principles and philosophy of human leadership, mental and business efficiency, and the science and art of salesmanship. Lect. 3.

20. **Business Statistics.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Edwards.

Statistical principles and methods. Uses of statistics in business. Assigned problems. Lect. 2.

Courses in Vocational Education for Teachers.

Courses for the preparation of high school teachers and leaders in the various fields of agricultural, industrial and home economics education are offered according to the federal plan for vocational education under the provisions of the Smith-Hughes Act of Congress passed in February, 1917.

The work is so arranged in kind and quantity as to make it possible for students, who desire a general course in agriculture, manual arts and home economics, to obtain such a course and at the same time secure a preparation, which will enable them to qualify as teachers of these subjects and for extension work. Three separate courses, each providing four years' instruction, are offered for persons who desire to fit themselves for the work indicated above.

A present and growing need in Montana is for men who have had special training for county agent and demonstration work. The time is not far distant when every county in the state will demand an agricultural specialist, one who will assist farmers in matters of organization, co-operation, pure bred stock and a more scientific cultivation of the soil. Students who are preparing for this work will be given an opportunity to visit counties where agents are employed, take in extension schools, study the methods of the different extension specialists at the college, and under the direction of the department and state county agent leader prepare extension projects. In so far as possible, the student in his preparation will meet the problems which he will later meet in the field.

The special training begins with the junior year in each course. The freshman and sophomore years in the agricultural courses prepare for the junior year of the course in Agricultural Education and Extension Methods. The freshman and sophomore years in the applied science courses will be accepted when they include not less than sixteen credits of agriculture. The freshman and sophomore years in home economics prepare for the junior year of the Teachers' Course in Home Economics. The freshman and sophomore years in any of the engineering courses prepare for the junior year in the Teachers' Course in Trades and Industry.

COURSE IN AGRICULTURAL EDUCATION AND EXTENSION METHODS FOR TEACHERS.

JUNIOR YEAR.

	Autumn	Winter	Spring
Economics (Econ. 3)	3		
Agricultural Economics (Econ. 6)		3	
Soil Physics (Agron. 2)	4	3	
Breeds of Livestock (An. Husb. 2a).....		4	
Breeds of Livestock (An. Husb. 2a).....			5
Nutrition of Farm Animals (An. Husb. 4a).....	5		
Development of Vocational Education (Ed. 3).....			3
Psychology (Ed. 1)	3		
Rural Life Problems (Agr. Ed. 3).....		4	
Woodwork (M. E. 2b)	2		
Common Diseases (Vet. Sci. 57)		5	
Rural Sociology (Soc. 7)			3
Elective	2		8

SENIOR YEAR

Principles of Breeding (Agron. 7)	6		
Beef Cattle and Sheep Production (An. Husb. 7)		4	
Teaching Practice (Agri. Ed. 2)	3	3	3
Farm Management (Agron. 6)	6		
Secondary Agricultural Education (Agr. Ed. 1).....		4	
Cooperation and Extension Methods in the Field (Agr. Ed. 5).....			3
Theory and Practice of Teaching (Ed. 5).....	3		
Agricultural Cooperation and Extension Methods (Agr. Ed. 4).....		4	
Poultry Management (Poult. 41)		4	
Thesis (Ed. 16)			2
Elective			11

COURSE IN HOME ECONOMICS FOR TEACHERS.

JUNIOR YEAR.

	Autumn	Winter	Spring
General Psychology (Ed. 1)	3		
Educational Psychology (Ed. 4)		3	
History of Vocational Education (Ed. 2)			3
Costume Design (Art 8)	5		
Advanced Dressmaking (H. E. 14)			3
Physiological Chemistry (Chem. 11)			5
Foods (H. E. 4)		3	
House Furnishing (Art 8b).....	3		
Home Nursing (H. E. 9).....		2	
Elective	8	10	8

SENIOR YEAR

Teaching Practice (H. E. Ed. 1).....		3	3
Dietetics (H. E. 6)	6		
Household Management (H. E. 7).....		4	
Theory and Practice of Teaching (Ed. 5).....	3		
Extension Course (H. E. 8)		4	
Special Methods (H. E. Ed. 2).....	3		
Home Problems (H. E. 10)			4
Sociology (Soc. 4)			3
Elective	7	8	9

COURSE IN TRADES AND INDUSTRY FOR TEACHERS.

FRESHMAN YEAR

	Autumn	Winter.	Spring
English Composition (Eng. 1)	3		
English Composition (Eng. 1a)		3	
English Composition (Eng. 1b)			3
General Chemistry (Chem. 1)	6	6	
Engineering Mathematics (Math. 1)	5		
Engineering Mathematics (Math. 2)		6	
Engineering Mathematics (Math. 3)			6
Mechanical Drawing (M. E. 1)	2		
Descriptive Geometry (M. E. 3)		3	4
Forge Work (M. E. 6)	2		
Machine Work (M. E. 9)			4
Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2)	2		
Expository Composition (Eng. 2a)		2	
Expository Composition (Eng. 2b)			2
Engineering Mathematics (Math. 4)	6		
Engineering Mathematics (Math. 5)		6	
Theoretical Mechanics (C. E. 5)			6
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Mechanism (M. E. 5)	3		
Machine Work (M. E. 21)	2		
Mechanism (M. E. 8)		3	2
Foundry (M. E. 4)		2	
Pattern Work (M. E. 2a)			2
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR.

Economics (Econ. 3)	3	3	
Industrial History (Hist. 10)	3	3	3
Applied Mechanics (C. E. 6a)	3		
Psychology (Ed. 1)	3		
Shop Management (T. I. 8)		3	
Industrial Organization and Management (T. I. 9)			3
Machine Design (M. E. 13)		3	4
Plumbing and Steam Fitting (M. E. 36)	2	2	
Carpentry (T. I. 1)	3		
Carpentry (T. I. 2)		3	
Cabinet Work (T. I. 3)			3
Machine Work (M. E. 21)	2		
Pattern Work (T. I. 6)			3
Forge Work (M. E. 6b)			3
Foundry (M. E. 4a)		2	

SENIOR YEAR

Electrical Machinery (E. E. 1)	3		
Electric Power (E. E. 14)		4	
Electric Power (E. E. 14a)			4
Steam and Gas (M. E. 7)		3	
Heat Power (M. E. 18a)			3
Gas Power (M. E. 22a)	3		2
Mechanical Laboratory (M. E. 15a)		2	
Concrete Construction (C. E. 44)		3	3
Principles of Teaching Trades and Industry (Ed. 15)	3	3	
Teaching Practice (Ed. 7b)	3	3	
Experience in Local Industries (T. I. 10)		3	3
Elective	4		
Thesis (T. I. 12)			4

TWO YEARS COURSE IN TRADES AND INDUSTRY.

The two years course is intended for the training of shop teachers. The attendance will be limited to those who have become masters of a trade, or to those who are at the time of enrollment acquiring such a mastery. In addition to the two years course of study as outlined, there is required two summers of practical work on a wage earning basis in one of the following capacities: Shop work as a helper or journeyman, as a carpenter, machinist, plumber, sheet metal worker, electrical constructionist, or auto mechanic. Such work is to be done during the summer months after the first and second years of the course.

The Superintendent of Public Instruction has the power to issue special certificates to persons showing satisfactory evidence of special proficiency in teaching trade and industrial subjects. Successful completion of the two years trades and industry course is regarded as sufficient evidence of this qualification.

FIRST YEAR.

	Autumn	Winter	Spring
English (Eng. a)	4	4	
Physics (Phys. a)	4	4	4
Shop Arithmetic (Math. e)	4	4	
Foundry (M. E. 4)		2	
Auto Practice (M. E. 32)			2
Pattern Work (M. E. 2a)			2
Mechanical Drawing (M. A. m)	2	2	
Mechanical Drawing (M. A. n)	2	2	
Machine Work (M. A. h)	2		
Forge Work (M. E. 6)			2
Elective			8
Military Science (Mil. Sci. a)	1	1	1

SECOND YEAR

General Psychology (Ed. 1)	3		
Educational Psychology (Ed. 4)		3	
History of Industrial Education (Hist. k)			3
Principles of Teaching Trades and Industry (T. I. 15).....	3	3	
Teaching Practice in Trades and Industry (T. I. 7a).....	3	3	
Industrial Organization and Management (T. I. 9).....			3
Carpentry (T. I. 1)	3		
Carpentry (T. I. 2)		3	
Cabinet Work (T. I. 3)			3
Foundry (M. E. 4a)		3	
Electrical Practice (M. A. t)	3	3	
Machine Work (M. A. h1)	3		
Elective			6
Pattern Work (T. I. 6)			3
Military Science (Mil. Sci. b)	1	1	1

Courses of Instruction.

AGRICULTURAL EDUCATION.

PROFESSOR, M. J. ABBEY.

1. **Secondary Agricultural Education.** 1 Q. Winter. 4 cr.

For students preparing to teach agriculture in the high schools. Organization of the class, equipment, laboratory instruction, field excursions, experimental plats, community work and agricultural clubs.

2. **Teaching Practice in Agriculture.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

The preparation of lesson plans and outlines with an opportunity to observe and teach classes in secondary agriculture.

3. **Rural Life Problems.** 1 Q. Winter. 4 cr.

The fundamental problems of rural life, social, political, religious, and educational agencies and methods of correlation. As the basis of the course, a survey of a typical rural community will be made.

4. **Agricultural Cooperation and Extension.** 1 Q. Winter. 4 cr.

Practical preparation for county agent work and modern methods of cooperative enterprise in agriculture.

5. **Cooperation and Extension Methods in the Field.** 1 Q. Spring. 3 cr.

Students will be required to do field work with county agents and specialists. Students will assist in extension schools and community meetings.

6. **Supervision.** 3 Q. Autumn, winter and spring. Continuous. 1 cr.

A course in supervision and follow-up instruction for teachers of agriculture in schools receiving aid under the provisions of the Smith-Hughes Act and supplementary State Legislation.

7. **Thesis.** 1 Q. Spring. 2 cr.

Each student must prepare a suitable thesis upon some subject relating to his course. The subject to be chosen early in the senior year after consultation with the class adviser.

EDUCATION.

PROFESSOR, J. M. HAMILTON (President). ASSISTANT PROFESSOR, J. H. HOLST.

The subjects listed under education are common to all the courses for vocational education. They are intended to give the prospective teacher a knowledge of psychology and the application of its principles in teaching. The materials selected for these courses refer especially to vocational training.

1. Psychology. 1 Q. Autumn. 3 cr. Mr. Hamilton.

General view of modern psychology, methods and materials of psychological investigation.

2. History of Vocational Education. 1 Q. Spring. 3 cr.

A brief survey of industrial education prior to 1800, some of the most significant developments during the nineteenth century, and the present status and need, including a brief study of vocational guidance. For home economics students.

3. Development of Vocational Education. 1 Q. Spring. 3 cr. Mr. Holst.

Offered to students in agricultural education and extension methods.

4. Educational Psychology. 1 Q. Winter. 3 cr.

Continuation of course 1, but considered from the standpoint of the studies of the curriculum. This will include some genetic and experimental psychology.

5. Theory and Practice of Teaching. 1 Q. Autumn. 3 cr. Mr. Holst.

A study of the aims of education, the fundamentals of teaching, the recitation, class management, and the use of scales.

HOME ECONOMICS EDUCATION.

PROFESSOR, ALBA BALES. ASSISTANT PROFESSORS, CARLOTTA M. FORD, EDITH FRANKS.

1. Teaching Practice in Home Economics. 2 Q. Winter and spring. 6 cr. Miss Bales.

Preparation of lesson plans and outlines with an opportunity to observe and teach classes.

2. Special Methods in Home Economics. 1 Q. Autumn. 3 cr.

Theory and practice of teaching domestic science and domestic art. Study is made of courses in various types of institutions. Courses of study are planned for graded schools, high schools and colleges. Lesson plans are given especial attention. Lect. 3; lab. 1.

3. Education of Women. 1 Q. Autumn. 3 cr. Miss Bales.

Survey of women's education, origin, and development of home economics.

4. Problems in Teaching Home Economics. 1 Q. Spring. 1cr.

A review of the special problems which a teacher will meet in elementary and secondary courses in home economics.

TRADES AND INDUSTRY

ASSISTANT PROFESSOR, R. T. CHALLENGER.

1. Carpentry. 1 Q. Autumn. 3 cr. Prerequisite Mechanical Engineering 2. Fee \$3.

Framing and rafter cutting. Special application is made of the subjects of plane geometry and descriptive geometry in the formulation of rafter cutting rules, which by means of the steel square are applied in the framing of model structures and roofs.

2. Carpentry. 1 Q. Winter. 3 cr. Prerequisite Trades and Industry 1. Fee \$3.

Continuation of Trades and Industry 1 with instruction in the use and care of special hand tools and power machines in the construction of window and door frames and interior finish. A study is made of the different styles of interior trim and arrangement of built-in fixtures.

3. Cabinet Work. 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 2. Fee \$1.

Study is made of courses of instruction suitable for grade and high school use in wood work, and in the proportion and design of standard projects in wood. Instruction and care of wood working machines as applied to school use is emphasized. Written reports will be required on current articles dealing with the subjects enumerated above and such subjects as stains, varnishes, glues, and paints. Lect. 2; lab. 1.

6. Pattern Work. 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 2a. Fee \$3.

Continuation of Mechanical Engineering 2a. Advanced work in the construction of patterns and match board work, together with a study of the methods employed in large pattern shops in the marking and storage of patterns.

8. Shop Management. 1 Q. Winter. 3 cr.

Instruction in the methods of scientific management in a factory. scientific time study, foremanship, the task idea, wages, standards for measuring efficiency and work planning. Lect. 3.

9. Industrial Organization and Management. 1 Q. Spring. 3 cr. Prerequisite Trades and Industry 8.

Selection of a locality for a shop or factory; the grouping of buildings; selection and arrangement of equipment; a study of the division of labor, and the over head cost of non-productive expense are considered. Lect. 3.

10. Experience in Local Industries. 2 Q. Autumn and Spring. 6 cr.

With the cooperation of local concerns and with their supervision, practical work will be offered in planing mills, plumbing shops and electrical shops. A grade of work satisfactory to the employer and the instructor in charge of the course will be required. Courtesy, obedience to orders, interest in the work, and the quality of the work done, are some of the determining factors.

12. **Principles of Teaching Trades and Industry.** 2 Q. Autumn. and winter. 6 cr.

The aims of education as they apply to the teaching of trades and industry subjects. Methods of organizing and conducting day and part time classes. Correlating school instruction with the present day economic demands.

13. **Teaching Practice in Trades and Industry.** 2 Q. Winter and spring. 6 cr.

Preparation of lesson plans and outlines with an opportunity to observe and teach classes.

14. **Thesis.** 1 Q. Spring. 4 cr.

Before graduation each student must present a suitable thesis upon some subject pertaining to the trade and industry work for schools.

Course for Nurses

It is the purpose of the State College of Agriculture and Mechanic Arts of the University of Montana to conduct a one-year course for the thorough, scientific training of the nurse.

This is best assured by the cooperation of the State College and the accredited training schools for nurses. It is the desire, also, of the college to make it the means of advancing the education of nursing women in Montana.

This course invites to matriculation, women of superior education and of large and earnest purpose, but most earnestly seeks the young woman, who having finished her high school course, wishes to take the three years training to become a registered nurse.

The State College is cooperating with some of the best known hospitals of the state, and at the end of one year's scientific training and the study in the laboratories, lectures, classes, and demonstrations, in the State College, the training schools will receive the successful student for two years practical work in the hospital.

The three years of work thus outlined leads to nursing work in private cases, laboratories, operating rooms; public health, X-ray work; office and school nurses.

The student showing organizational ability may prepare for the positions of hospital superintendents and managers.

There is a distinct advantage in taking the scientific work as outlined, as a preparation for the practical work, as this gives the student an opportunity of institutional training in their every day living as the students registering for this course will live in Hamilton Hall and share in the social training with the other college women.

COURSE FOR NURSES.

	Autumn	Winter	Spring
English Composition (Eng. 11)	3		
Modern History (Hist. 7)	2	2	2
General Chemistry (Chem. 1)	6	6	
Elementary Bacteriology (Bact. 15)			5
Invertebrate Zoology, (Zool. 1)	6		
Human Physiology and Anatomy (Zool. 3).....		6	
Organic Chemistry (Chem. 5)			6
Foods (H. E. 22)		3	
Dietetics (H. E. 23)			4
Physical Education (Phys. Ed. 3)	2	2	2

Courses in General

ECONOMICS AND SOCIOLOGY.

PROFESSOR, J. M. HAMILTON (President).

3. **Economics.** 2 Q. Autumn and winter. 6 cr.

Principles of economic science. Study of such questions as labor and capital, banking, transportation, and taxation. Lect. 3.

4. **Sociology.** 1 Q. Spring. 3 cr.

Introduction to sociology. Attention given to the problems of marriage and divorce, immigration, race questions, charities and corrections, pauperism and crime. Lect. 3.

6. **Agricultural Economics.** 1 Q. Winter. 3 cr. Prerequisite Economics 3.

Agricultural economic problems; value and rent of land; agricultural labor; rural credit; cooperative associations. Lect. 3

7. **Rural Sociology.** 1 Q. Spring. 3 cr. Prerequisite Sociology 4.

Rural social problems; rural health; country church; rural schools; roads; recreations, etc. Lect. 3.

ENGLISH.

PROFESSOR, W. F. BREWER, MRS. UNA B. HERRICK, (Dean). ASSISTANT PROFESSOR, E. A. DUDDY. INSTRUCTOR, JESSIE DONALDSON.

In all the courses in English, written work plays an important part. That this work may be kept up to the proper grade, it is announced here that in college English work no paper will receive any credit that shows notable carelessness or ignorance in elementary matters of punctuation, grammar, rhetoric, or in the spelling of common words.

1. **English Composition.** 1 Q. Autumn, winter. 3 cr. Mr. Duddy, Miss Donaldson.

1a. **English Composition.** 1 Q. Winter, spring. 3 cr. Mr. Duddy, Miss Donaldson.

1b. **English Composition.** 1 Q. Spring. 3 cr. Mr. Duddy, Miss Donaldson.

Rhetorical principles. Written and oral composition, with study of types of prose composition.

2. **Expository Composition.** 1 Q. Autumn, winter. 2 cr. Mr. Brewer.

2a. **Expository Composition.** 1 Q. Winter, spring. 2 cr. Mr. Brewer.

2b. **Expository Composition.** 1 Q. Spring. 2 cr. Mr. Brewer.

English 2, 2a, 2b, required of all sophomores.

Instruction in the handling of units of expository composition from 300 to 600 words. As a basis for the written work, essays adapted to the vocational outlook of the students are assigned for reading each week and discussed orally in the class room. The subjects of the essays are such as will relate the student's idea about his vocation to the various fields of knowledge with which he must come in contact either as student or vocational worker.

3. **Advanced English Composition.** 1 Q. Autumn. 2 cr. Mr. Brewer.

Elective for juniors and seniors.

3a. **Advanced English Composition.** 1 Q. Winter. 2 cr. Mr. Brewer.

Writing of technical papers especially adapted to the needs of technical students. Will apply in a special field the fundamentals of written and oral composition as given in English 1 and 2. In conducting the course the English department cooperates with the technical departments represented by the students who take the course.

3b. **Advanced English Composition.** 1 Q. Spring. 2 cr. Mr. Brewer.

Elective for juniors and seniors. Study of periodicals, trade journals, bulletins, etc. Study of "Use Books," preparation of manuscripts for publication, proof reading. This course to be adapted to the vocational needs of the students.

5. **Argumentation and Forms of Public Address.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Duddy.

Principles of argumentation; briefs and debates. Some study of the forms of public address with written and oral practice. Elective for seniors, juniors, and sophomores who have credit for courses 1 and 2. At the pleasure of the instructor, sophomores who are taking course 2 may also elect course 5.

6. **Modern Drama.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite English 1. Mrs. Herrick.

Survey of the modern drama in Europe and America, with emphasis on influence of Ibsen and Shaw. Elective for juniors and seniors. With the consent of the instructor it may be taken in any quarter separately.

10. **English Literature.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Brewer.

Nineteenth century English literature; a study of nineteenth century prose and poetry. Reading of representative selections with particular reference to their political, social and economic setting. Lectures and class room discussions.

11. **English Composition.** 1 Q. Autumn. 3 cr. Mr. Duddy.

For students taking the course for nurses.

14. **Contemporary Literature.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Brewer.

A reading and discussion course in contemporary English and American literature covering the period 1890-1915. (Not offered in 1919-1920.)

FRENCH AND SPANISH

ASSISTANT PROFESSOR, FLORENCE WALLIN.

1. **French.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Elements of grammar based on Fraser and Squairs' French Grammar, with constant practice in pronunciation, dictation and conversation. Reading of easy texts.

2. **French.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Review of grammar. Typical fiction and dramas of the nineteenth century. Advanced composition and original theme writing. Conversation and dictation.

3. **French.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Study of classical and modern dramas and novels. Masterpieces of Corneille, Moliere, Racine, Rostand, Hugo, and Balzac. Collateral reading and reports.

20. **Spanish.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Elements of grammar with conversation and special emphasis on pronunciation. Reading of short stories and easy novels.

21. **Spanish.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Reading of modern novelists and dramatists. Conversation and composition.

GEOLOGY.

ASSISTANT PROFESSOR, E. J. QUINN.

The subjects of mineralogy and geology are important not only to the student of general science, but also to those who are specializing along some particular applied line. Here the student of agriculture gains an insight into the nature of the soil as merely one particular

phase of the broader subjects of rock formation, and disintegration, and from his knowledge of rocks, rock forming minerals, and the changes which these minerals undergo gains the ability to classify soils in a systematic manner. The engineer is enabled both to distinguish between the various types of rocks and minerals, and also to foresee how a given constructive material will withstand various conditions of weathering, and other destructive agents. The science student, in any field, finds in geology and mineralogy a history of the nature and origin of all the materials with which he comes in contact, and having command of such data he approaches his subject in a well prepared and intelligent manner.

The department museum, containing an excellent collection of minerals, rocks, and fossils, is constantly drawn upon for illustrative material. In addition, the publications of the United States Geological Survey are at the command of the student and are used as reference in connection with special topics.

1. **General Geology.** 1 Q. Winter or spring. 4 cr. Prerequisite Chemistry 1.

Application of the science of agriculture and engineering. Rocks and rock forming minerals and their classification. A trip to Morrison cave, an interesting formation lying about fifty miles west of Bozeman, will be included in the field work. Lect. 4.

2. **Mineralogy.** 1 Q. Autumn or spring. 4 cr. Prerequisite Chemistry 1. Fee \$3; deposit \$3.

Crystallography, and the classification and identification of the more important minerals and rocks. Lect. 2; lab. 2.

GERMAN.

Instruction in German is suspended under the order of the State Council of Defense.

1. **Elementary German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Grammar and easy readings, with practice in speaking and writing German. Open to college students who have not had high school or preparatory German.

2. **Intermediate German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite German 1.

Modern prose, narrative and dramatic. Grammar review and elementary syntax, written and oral exercises.

3. **Advanced Freshman German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Classical and modern writers. Selected works of Schiller, Heine, Freytag, Sudermann and others. Conversation, composition and syntax. Open to freshmen who have had two years of high school German.

4. **Classics of the Eighteenth Century.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Masterpieces of Lessing, Goethe and Schiller.

5. **Modern German Dramatists.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Selected dramas of Grillparzer, Hebbel, Sudermann, Hauptmann, and others. A rapid reading course.

6. **Scientific German.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisites German 1, 2.

For students specializing in science. Rapid reading of scientific prose.

HISTORY.

ASSISTANT PROFESSOR, HELEN R. BREWER.

1. **European History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

The development of modern Europe. Use of the library with lectures on historical methods.

2. **Medieval History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Alternates with History 5.

First two quarters a text book is used; last quarter on the Italian Renaissance, topical references to the library and pictures.

5. **American History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1. Alternates with Medieval History 2.

United States history covering the period of constitutional development. Use of the library is required, and the student is expected to spend about one-fourth time in the preparation of a paper.

7. **Modern History.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Current events, a review of the political and industrial development of the last few decades.

10. **Industrial History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1.

Outlines of United States industrial history. Each quarter the student will write a paper on some special line of industry which he either reads upon or personally investigates.

MATHEMATICS.

PROFESSOR, W. D. TALLMAN. INSTRUCTORS, FRIEDA BULL, ANNIE BRENNEMAN

The students in this department have access to the following journals: American Journal of Mathematics (complete set); Annals of Mathematics (from 1900); Bulletin of American Mathematical Society (1898 to date); also about 200 volumes of recent treatises on mathematics. It may also be mentioned that in the engineering and physics department libraries may be found treatises and journals of applied mathematics.

1. Engineering Mathematics. 1 Q. Autumn. 5 cr. Mr. Tallman.

The first three fifths of the quarter's work is given in plane trigonometry. The remainder of the quarter is devoted to college algebra. The work of this quarter and about half of the following quarter covers a review of radicals and quadratic equations, progressions, binomial theorem, theory of limits, undetermined coefficients, infinite series, permutations and combinations, probability, and an introduction to the theory of equations.

2. Engineering Mathematics. 1 Q. Winter. 6 cr. Mr. Tallman.

Half of the quarter is devoted to the continuation of the algebra started in the first quarter and the remainder of the time is devoted to analytical geometry.

3. Engineering Mathematics. 1 Q. Spring. 6 cr. Mr. Tallman.

Continuation of analytical geometry and work in calculus covering "Woods & Bailey" course in mathematics, Vol. I, with the exception of the last three chapters.

4. Engineering Mathematics. 1 Q. Autumn. 6 cr. Mr. Tallman.

"Woods & Bailey" Vol. I is completed and the subjects of integral calculus, solid analytical geometry, elements of differential equations are given substantially as in Vol II in this course and course 5.

5. Engineering Mathematics. 1 Q. Winter. 6 cr. Mr. Tallman.

Continuation of course 4.

6. Astronomy. 1 Q. Spring. 3 cr. Prerequisites Physics 1, Mathematics 4, 5. Mr. Tallman.

Spherical astronomy with an introduction to some celestial mechanics.

7. Trigonometry and Logarithms. 1 Q. Autumn, spring. 4 cr. Mr. Tallman.

9. College Algebra. 1 Q. Spring. 5 cr.

Covers the ground given to algebra in Mathematics 1, 2.

10. Differential Equations. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Ordinary and partial differential equations with geometrical and mechanical applications.

11. **Partial Differential Equations of Mathematics-Physics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Course based on Weber's "Die Partielle Differential Gleichungen der Mathematischen Physic," and Byerley's "Spherical Harmonics."

12. **Theory of Least Squares and Probable Error.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 5. Mr. Tallman.

13. **Statistics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite Mathematics 4. Mr. Tallman.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics.

15. **Mathematical Theory of Investments.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 2, 9 or 16. Mr. Tallman.

16. **Elementary Analysis.** 3 Q. Autumn, winter, spring. 12 cr.

A brief course in mathematics covering the fundamental principles of college algebra, trigonometry, analytical geometry, and calculus designed to meet the needs of scientific students who cannot find the time to take the more extended course in these subjects found in Engineering Mathematics courses 1, 2, 3, 4, 5.

Courses 3, 4, 5, will be repeated in other quarters than scheduled if demanded by six or more students. During the fourth quarter such of the above courses will be offered only when sufficient numbers of students demand them. Should there be a demand during the fourth quarter a 12 credit course covering 2 and 3 or one covering 4 and 5 may be offered.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN C. O. HEATH. INSTRUCTOR

An infantry unit, senior division, of the Reserve Officers' Training Corps has been established at this college by the President of the United States, under the provisions of the National Defense Act of 1916. The primary object is to qualify, by systematic and standard methods of training, students at civil educational institutions for reserve officers, this to be done with the least practicable interference with their civil careers. An officer of the army is detailed by the War Department as Professor of Military Science and Tactics; he also acts as Commandant of Cadets.

By law, the military course is compulsory for all physically fit male students, not aliens, during their first two years; the minimum time required is three hours per week, and satisfactory completion of the course is a prerequisite for graduation. The military course is

optional for students after their sophomore year; those who elect to continue must agree in writing to continue in the Reserve Officers' Training Corps during the remainder of their course in college, to devote five hours per week to it, and to pursue the courses of camp training that may be prescribed by the Secretary of War. In consideration of this agreement the government purposes to pay the cadet so electing to continue his military studies a sum of money not to exceed the cost of the garrison ration; this is now approximately thirty cents a day. Cadets completing the four-years military course will be eligible for appointment in the army as temporary second lieutenant for six months, with a pay of \$100 per month and allowances of a regular second lieutenant. The graduate will also be eligible for appointment as a reserve officer.

The college is put to no expense for the military instruction other than proper housing for indoor drill and for government property furnished. The government furnishes the necessary services of officers and non-commissioned officers, uniforms and equipments for the cadets.

1. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Heath.

(a) Practical. Physical drill; infantry drill, close and extended order; gallery practice; care of rifle and equipment.

(b) Theoretical. Theory of target practice; military organization; map reading; security; hygiene.

(c) Practical. Physical drill; infantry drill; intrenchments; first aid; target practice.

(d) Theoretical. Lectures; general military policy and obligations of citizenship; service of information; combat; infantry drill; camp sanitation.

2. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Heath.

(a) Practical. Combat firing if practicable.

(b) Theoretical. Infantry drill regulations; small-arms firing regulations; lectures as in course 1 (d); map reading; camp sanitation and camp expedients.

(c) Practical. Signaling; first aid; intrenchments, field works, obstacles, bridges, etc.; range practice.

(d) Theoretical. Lectures, recent military history; small tactical problems; marches and camps.

3. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Heath.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Minor tactics; field orders; map maneuvers; company administration; military history.

(c) Practical. Military sketching.

(d) Theoretical. Minor tactics continued; map maneuvers; elements of international law; property accountability.

4. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Heath.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Tactical problems, small forces; court-martial proceedings; international relations of America; general principles of strategy. Open to students ranking as seniors in the college.

(c) Practical. Same as (a).

(d) Theoretical. Tactical problems continued; map maneuvers; rifle in war. Lectures on military history and policy. Open to students ranking as seniors in the college.

MUSIC.

PROFESSORS, A. H. CURRIER, G. W. NASH. INSTRUCTORS, JUNE HARTMAN, F. JACKSON, L. HOWARD.

There is a universal demand that education in music shall be provided for in schools and colleges. Some knowledge of applied music is coming to be more and more a part of liberal culture and the valuable influence of good music in family and social life needs no discussion.

Accordingly the department of music offers to students of the college and others opportunity to pursue under competent instructors the main branches of music study.

Tuition is payable to the secretary of the college in advance. No reduction will be made for absence from lessons. Teachers will make up hours they fail to give according to schedule.

Non-resident students of music must be enrolled in other work, so that the total amount is equal in time spent to eighteen credits. For such students is recommended the study of home economics, languages, literature, history, and art.

The department is closed on the college and national holidays. Lessons falling on these days will not be made up.

No student is permitted to take part in any public performance without consent of the director.

Students of this department will be granted certificates, if desired, testifying to quality and amount of work done.

Recitals are given from time to time by the instructors and advanced students to which admission is free.

Music to a total of not more than six credits may be counted toward a degree in those courses which allow free electives. To those regular students who elect music the college will furnish free one thirty-minute lesson a week during the junior and senior years, or any quarter of either year; and the work may be elected in either vocal or instrumental music.

PIANO.

The instruction in piano will comply with the special needs of each individual student, and the courses of music given them to study, will be taken from the works of such standard composers as are recognized by the leading musicians and musical institutions of the world. Specimen programs illustrating the class of music taught will be sent to anyone interested by the department. Elementary harmony is given with the piano lessons as an aid to the analysis of each piece, which is so necessary in memorizing.

Ensemble and Sight Reading.

In this branch of instruction lie indispensable elements of musical knowledge and culture. Ensemble playing develops the students' ability in sight reading, and enables them to acquire an acquaintance with the masterworks of symphonic and orchestral literature, which is ordinarily inaccessible to the music student.

Theory.

Courses in harmony and musical history will be given if the demand justifies.

VOICE.

The training and development of the voice proceeds hand in hand with the acquisition of musical tastes and intelligence. Methods are adapted to individual needs. The voice is trained for correct placement, artistic tone, flexibility and agility. The possibilities of varied tone qualities for expressional purposes are emphasized and illustrated. The study of vocal technique includes the subjects of breathing, resonance, tone color, correct attack, sustained tones, scales, arpeggios, legato, staccato, embellishments. Various exercises are used. Attention is given to elegance of diction.

The cultivation of musical taste and artistic interpretation is effected by study of the best modern and classic art songs, operatic arias, and oratorio selections. The art of singing is a complex one as so much depends on the intellectual and emotional status of the singer. Hence the singer should aim to acquire general culture, appreciation of the beautiful in the world of thought and emotion as well as in the realm of sound.

VIOLIN.

The aim of the department is the acquisition of thorough technique and the study of the works of the best masters. Ensemble playing forms an important part of the course.

MUSIC TUITION.**Piano With Mr. Nash.**

One half-hour lesson per week for one quarter.....	\$15.00
Two half-hour lessons per week for one quarter.....	27.00
Ensemble playing per quarter	7.00

Piano With Miss Hartman.

One half-hour lesson per week for one quarter.....	\$12.00
Two half-hour lessons per week for one quarter.....	23.00

Voice With Mr. Currier.

One half-hour lesson per week for one quarter.....	\$15.00
Two half-hour lessons per week for one quarter.....	27.00

Violin With Mr. Jackson.

One forty-five minute lesson per week for one quarter.....	\$18.00
Two half-hour lessons per week for one quarter.....	24.00
One hour ensemble lesson per week for one quarter.....	18.00

When students enter late, lessons missed will be deducted at the rate of \$1.00 per lesson.

Piano practice on the college pianos may be arranged for at the following rates:

One hour daily per quarter	\$3.00
Additional hour per quarter	2.50

PHYSICAL EDUCATION.

*DIRECTOR, UNA B. HERRICK (Dean). INSTRUCTOR, LORA MAXWELL.

The aim of the physical education department for women is to develop each woman to her highest economic value as a unit of society, to the end that when she finishes her college course she may carry forth into life a sane, well balanced, logical mind, high moral character, and a strong, symmetrical, properly functioning body, capable of assuming and performing cheerfully and well the duties of cultured womanhood.

Students who are received for any reason of the requirements in physical training, shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirements any student in the employ of the institution.

Indoor and outdoor tennis courts and a volley ball court are furnished for the women, and beginning classes are organized; competitive games, including indoor baseball, are played between classes throughout the year

Lectures are given on personal hygiene; general deportment for women; dress from the standpoint of health and appearance; the physiology of bodily exercise. The regulation gymnasium suit and shoes, which may be obtained from a local dealer, will be required.

1. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rythmic dancing and games. Lect. 2.

2. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

The work will consist of lectures and recreational games. Lect. 2.

3. **Playground.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Maxwell.

This course will include thorough preparation in theory, methods and practice teaching in physical education. Games, playground work, corrective exercises and folk dancing.

4. **First Aid.** 2 Q. Winter and spring. 4 cr. Miss Maxwell.

First aid and hygiene. Designed to give students useful and practical knowledge of what they should do when accidents and illness occur, in their own environment.

PHYSICS.

PROFESSOR, F. W. HAM. INSTRUCTORS, J. A. KIEFER, ANNIE BRENNEMAN.

The following courses in physics are designed to meet the needs of (1) those students who are preparing to take up some of the more technical studies in engineering, agriculture, or home economics, (2) those who expect to become physics or science teachers and (3) those general science students who wish to acquire some scientific training which is peculiar to the science of physics alone.

1. **Engineering Physics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Ham.

More mathematical than Physics 1a and particularly designed to meet the needs of students in engineering. Students who have not completed the calculus, mathematics 4, are required to take it during the same year that Physics 1 is taken. Lect. 3.

1a. **Agricultural Physics.** 1 Q. Spring. 6 cr. Prerequisite Mathematics 8 or its equivalent. Fee \$1; deposit \$1. Mr. Ham.

A general course with special emphasis on the fundamental principles of physics important in the different branches of agriculture. Lect. 3; lab. 3.

2. **Physical Measurements.** 3 Q. Autumn, winter, and spring. Continuous. 6 cr. Mr. Kiefer. Fee \$1; deposit \$1.

Laboratory course designed to supplement Physics 1. Lab. 2.

3. **Light and Sound.** 1 Q. Spring. 3 cr. Prerequisites Physics 1, 2. Mr. Kiefer.

Theory of light in its application to familiar optical phenomena and to optical instruments. The phenomena and laws of sound. Lect. 3.

4. **Physical Measurements.** 1 Q. Spring. 2 cr. Fee \$1; deposit \$1. Mr. Kiefer.

Laboratory course in light and sound to supplement Physics 3. Lab. 2.

5. **Electricity and Magnetism.** 2 Q. Autumn and winter. 6 cr. Prerequisites Physics 1, 2, Mathematics 4. Fee \$1; deposit \$1. Mr. Ham.

Methods for the exact measurements of resistance, electro-motive force, current, capacity, and the co-efficient of self induction. Calibration of commercial instruments, insulation testing, and magnetic measurements. Lect. 2; lab. 1. Lect. 1; lab. 2.

6d. **Pedagogy of Physics.** 1 Q. Spring. 4 cr. Prerequisites Physics 1, 2, 3, 4. Mr. Ham.

Methods of teaching, the selection and performance of effective lecture table and laboratory experiments and practice on presenting the topics covering such experiments to elementary and college classes. Lect. 4.

9. **Household Physics.** 1 Q. Spring. 5 cr. Fee \$1; deposit \$1. Mr. Ham.

A general course including the physics of ventilation, the lighting and heating of houses and other physical phenomena of interest to the housekeeper. Lect. 2; lab. 3.

10. **Meteorology.** 1 Q. Spring. 4 cr.

Sources and measurement of atmospheric temperature, pressure and circulation of the atmosphere, measurement and movement of moisture, cause and prevention of frost. Part of the course will consist of a study of Montana weather bulletins. Lect. 4.

11. **Electron Theory.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 10 credits of College Physics. Mr. Ham.

Graduate course open to undergraduates who can satisfy the prerequisites. Not a survey course but a discussion of recent research work. Lect. 3.

14. **General Physics.** 2 Q. Winter and spring. 8 or 10 cr. Prerequisites, elementary algebra and trigonometry.

A course for students desiring a general knowledge of physics either in connection with the other sciences or as a matter of general education. The course will consist of a general survey of mechanics, heat, light, electricity and magnetism, and sound, and will be less mathematical than the technical courses in physics.

Lecture demonstrations will be numerous and the student will be given an opportunity to test many of the laws for himself in the laboratory. Lect. 2; lab. 2; lect. 3; lab. 2.

16. **Advanced Heat.** Autumn. 4 cr. Prerequisites Physics 1 and 2 or 14. Fee \$1; deposit \$1. Mr. Ham.

A continuation of the study of the laws of heat begun in Course 1. Special attention will be given to methods of heat transmission, thermometry, specific heats and the laws of thermodynamics. Lect. 3; lab. 1.

Secondary Schools.

The secondary schools offer the following courses:

1. School of Agriculture; 2. School of Home Economics; 3. School of Mechanic Arts. These courses continue through a period of three years of six months each.

School of Agriculture.

The School of Agriculture offers practical instruction to the young men from the farms of Montana who wish to fit themselves for successful farming. The courses offered are intended as a preparation for life rather than for college. The student is brought into actual contact with the problems connected with the farm and learns that agriculture is a profession requiring both skill and knowledge.

Students in this school have the privilege of studying a modern dairy in operation, including types of the best breeds of dairy cattle; a complete poultry plant in operation, containing breeds illustrating especially the best laying strains and market fowls; modern grain and soil laboratories; model farm buildings and barns, with pure bred livestock; the experiment station farm; greenhouse and orchards; and the large biological, chemical and physical laboratories, and well-equipped wood and iron shops of the engineering department.

The variety of animals included upon the farm affords ample opportunity to see the various diseases, injuries, etc., encountered in farm animals. In the veterinary building, there is provided a clinic room, where the sick and injured animals are treated, and the student is given the benefits of these demonstrations.

The course extends through three years of six months each and comes in the winter season when the young men can be spared from farm work. For admission to this school, students must have passed the eighth grade or its equivalent, or give satisfactory evidence to the principal of the school that they are capable of carrying on the work. Young men twenty-one years of age or over will be admitted to the course without having completed the eighth grade provided they have had some practical experience on the farm and possess a fair common school education. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF AGRICULTURE.

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a).....	4	4
Elementary Physics (Phys. b)	5	
Animal Types (An. Husb. b)		2
Animal Types (An. Husb. a)	2	
Mechanical Drawing (M. A. k)	2	2
Parliamentary Law (Eng. d)		2
Carpentry (M. A. a)	2	2
Elective	4	7
Military Science (Mil. Sci. a)	1	1

SECOND YEAR

English Composition (Eng. b)	2	2
Plant Propagation and Tree Planting (Hort. a)	4	
Elementary Chemistry (Chem. a)		5
Field Crops (Agron. b)		4
Field Crops (Agron. a)	4	
Breed Types (An. Husb. d)		2
Farm Dairying (Dairy a)	3	
Forge (M. A. b)		2
Breed Types (An. Husb. c)	2	
Common Diseases (Vet. Sci. a)		4
Soils (Agron. c)	4	
Dairy Management (Dairy b)		3
Elective	3	
Military Science (Mil. Sci. b)	1	1

THIRD YEAR

Composition and Literature (Eng. c)	2	2
Farm Management and Accounts (Agron. d)	4	
Plant Diseases (Bot. a)		3
Feeding and Management (An. Husb. e)	3	
Feeding and Management (An. Husb. f)		3
Animal Breeding (An. Husb. d)	3	
Rural Sociology (Soc. b)		3
Agricultural Economics (Econ. a)	3	
Farm Motors (M. A. s)		3
Forge (M. A. b)	2	
Insect Pests (Ento. a)		3
Elective	5	5
Military Science (Mil. Sci. c)	1	1

Note—Electives and options must be selected subject to the approval of the principal of the secondary schools.

Electives: First Year, Autumn Quarter: Mathematics (a), (f); History (d).

Electives: First year, Winter Quarter: Mathematics (a), (e); Horticulture (b); Art (b); History (a); Agronomy (e). Those who take Mathematics (a) the first quarter of the first year will continue with the chosen subject the Winter Quarter.

School of Home Economics.

The School of Home Economics is designed especially to fit young women to become home builders. The well equipped laboratories, kitchens, sewing rooms, dairy, greenhouses, etc., are admirably fitted for making instruction intensely practical.

The entrance requirement of the three-years course is the completion of the eighth grade in the common schools or the equivalent. The young women who do not continue their studies have a practical training which fits them for home making, and which furnishes an excellent preliminary training for the vocations based upon domestic science and art.

The course extends through three years of six months each. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF HOME ECONOMICS.

	Autumn	Winter
FIRST YEAR		
English Exercises (Eng. a)	4	4
Textiles (H. E. c)	2	
Garment Making (H. E. a)	2	4
Drawing (Art a)	2	2
Parliamentary Law (Eng. d)		2
Cooking (H. E. g)	4	4
Industrial Arithmetic (Math. f)	4	
Home Gardening (Hort. d)		3
Physical Education (Phys. Ed. a)	1	1

SECOND YEAR

English Composition (Eng. b)	2	2
Cooking (H. E. e)	4	4
Dressmaking (H. E. b)	3	4
Household Sanitation (H. E. k)	3	
General History (Hist. a)	4	4
Chemistry (Chem. a)		5
Elective	4	
Physical Education (Phys. Ed. b)	1	1

THIRD YEAR

Composition and Literature (Eng. c).....	2	2
House Planning and Decoration (H. E. m)	3	
Home Dairying (Dairy c).....		3
Home Nursing (H. E. f)	2	
Household Management (H. E. j).....		4
Foods (H. E. h)	2	2
Dressmaking (H. E. d)	2	2
Elective	8	6
Physical Education (Phys. Ed. c).....	1	1

Note—Electives and options must be selected subject to the approval of the principal of the secondary schools.

School of Mechanic Arts.

The course in Mechanic Arts is designed for those who want to prepare for a vocation. Courses in several groups of trades are offered prominent among them are (1) wood work in carpentry, cabinet and pattern making; (2) metal work in machine shop, forge and foundry; (3) auto mechanics including repair and operation of automobiles; (4) gasoline engines and tractors. There is also work in mechanical drawing, steam boilers and engines and electrical practice.

For admission to this course the equivalent of an eighth grade certificate is required. Applicants of mature age can take work for which they are qualified.

The large, well equipped science laboratories, drawing rooms, and shops provide facilities for work that will rank with the best secondary polytechnic schools. The instruction is given by the regular faculty members in these subjects. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF MECHANICS.

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a)	4	4
Algebra (Math. a)	4	4
Mechanical Drawing (M. A. m)	2	2
Forge (M. A. b) or Carpentry (M. A. a)	2	2
Military Science (Mil. Sci. a)	1	1
Electives	6	6

In choosing electives the student should take subjects in the group of trades of which he is preparing for a vocation. The following is the list of the groups of subjects which may be taken as electives.

Carpentry, Cabinet Work, and Pattern Work
Automobile Repair and Operation
Gasoline Engine Repair and Tractor Operation
Steam Boilers and Engines
Machine Work, Forge and Foundry Work.

SECOND YEAR

English Composition (Eng. b)	2	2
Shop Arithmetic (Math. e)	4	4
Elementary Physics (Phys. c)	4	4
Mechanical Drawing (M. A. n)	2	2
Elective	7	7
Military Science (Mil. Sci. b)	1	1

Elective courses for the second year should be taken from the group of subjects chosen by the student when he elected courses in his first year.

THIRD YEAR

Composition and Literature (Eng. c)	2	2
Geometry (Math. c)	4	4
Elective	13	13
Military Science (Mil. Sci. c)	1	1

Elective courses for the third year should be taken from the group of subjects chosen by the student when he elected courses in his first and second years.

Courses of Instruction.

AGRONOMY.

PROFESSOR, A. ATKINSON. ASSISTANT PROFESSORS, E. L. CURRIER, L. F. GEISEKER, H. E. MURDOCK, H. SUMNER.

a. **Field Crops.** 1 Q. Autumn. 4 cr. Mr. Sumner.

A study of the types and methods of growing wheat, oats, barley, flax, rye and corn. Lect. 3; lab. 1.

b. **Field Crops.** 1 Q. Winter. 4 cr. Prerequisite Agronomy a. Mr. Sumner.

Grass, clover and other crops used for hay, pasture, or silage. Lect. 3; lab. 1.

c. **Soils.** 1 Q. Autumn. 4 cr. Fee \$1. Mr. Gieseke.

A study of the formation and classification of soils and of the best methods of cultivating and of maintaining the productiveness of the soil under Montana conditions. Lect. 3; lab. 1.

d. **Farm Management and Accounts.** 1 Q. Autumn. 4 cr. Mr. Currier.

Fundamental principles involved in the successful organization and management of a farm are considered. Lect. 3; lab. 1.

e. **Farm Machinery.** 1 Q. Winter. 3 cr. Prerequisite Physics b. Mr. Murdock.

Study of the various types of farm machinery. Selection, adjustment and care of farm machinery. Modern farm conveniences, such as telephones, water supply systems, etc. Lect. 2; lab. 1.

f. **Irrigation and Drainage.** 1 Q. Autumn. 2 cr. Prerequisite Physics b. Mr. Murdock.

Methods of irrigating and draining land. Lect. 1; lab. 1.

ANIMAL HUSBANDRY.

PROFESSOR, C. N. ARNETT. ASSISTANT PROFESSOR, R. C. MCCORD, INSTRUCTOR, O. TRETSVEN.

a. **Animal Types.** 1 Q. Autumn. 2 cr. Fee \$1. Mr. Tretsven. Market types of cattle and sheep. Lab. 2.

b. **Animal Types.** 1 Q. Winter. 2 cr. Fee \$1. Mr. Tretsven. Judging of market types of dairy cattle, horses and swine. Lab. 2.

c. **Breed Types.** 1 Q. Autumn. 2 cr. Fee \$1. Prerequisites Animal Husbandry a, b. Mr. McChord.

Breed types of cattle and sheep. Lect. 1; lab. 1.

d. **Breed Types.** 1 Q. Winter. 2 cr. Prerequisites Animal Husbandry a, b. Mr. McChord.

Breed types of dairy cattle, horses, and swine. Lab. 2.

e. **Feeding and Management of Livestock.** 1 Q. Autumn. 3 cr. Fee \$2. Prerequisites Animal Husbandry c, d. Mr. Tretsvén.

Methods of feeding and managing cattle and sheep. Methods by which animals are prepared for the show ring. Lect. 2; lab. 1.

f. **Feeding and Management of Livestock.** 1 Q. Winter. 3 cr. Fee \$2. Prerequisites Animal Husbandry c, d. Mr. Tretsvén.

Methods of feeding, showing and managing horses and hogs. Lect. 2; lab. 1.

g. **Animal Breeding.** 1 Q. Autumn. 3 cr. Prerequisites Animal Husbandry c, d. Mr. McChord.

Principles of breeding as directly applied to the farm. Cross breeding, inbreeding, and line breeding. Lect. 2; lab. 1.

ART.

ASSISTANT PROFESSOR, LANA BALDWIN. INSTRUCTORS, MURIEL MOORE, MILDRED BERRY.

a. **Drawing.** 2 Q. Autumn and winter. 4 cr. Fee \$.50. Miss Berry.

Freehand drawing from geometric solids and casts. Study of light and shade. Object drawing, in charcoal, pencil, pen and ink. Study of linear perspective with practical exercises in perspective sketching. Lab. 2.

b. **Drawing.** 2 Q. Autumn and winter. 4 cr. Fee \$.50. Miss Moore.

Continuation of course a, with study of design and handicraft. Lab. 2.

BOTANY AND BACTERIOLOGY.

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

a. **Plant Diseases.** 1 Q. Winter. 3 cr. Fee \$1. Mr. Jennison.

A study of the importance, symptoms, and methods of control of the more important diseases of plants. Lect. 2; lab. 1.

CHEMISTRY.

PROFESSOR, W. M. COBLEIGH. INSTRUCTOR, E. C. HYTREE.

a. **Elementary Chemistry.** 1 Q. Winter. 5 cr. Fee \$4; deposit \$4. Mr. Hytree.

Lectures with experimental illustrations, and recitations on general elementary chemistry. Special emphasis will be given to the applications of the science to daily life and to agriculture. Lect. 3; lab. 2.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

a. **Farm Dairying.** 1 Q. Autumn. 3 cr. Fee \$2; deposit \$.50.

Dairy problems as applied to building up the dairy herd, care and management of the herd, and marketing dairy products. Applications of the Babcock test, and operation of hand separators. Lect. 2; lab. 1.

b. **Dairy Management.** 1 Q. Winter. 3 cr. Fee \$1; deposit \$.50.

Factors influencing the secretion, composition and properties of milk, care, and handling of milk and cream; hand separators, cooling vats, grading, sampling and testing milk and cream; making butter and cheese on the farm and marketing dairy products. Lect. 2; lab. 1.

c. **Home Dairy.** 1 Q. Winter. 3 cr. Fee \$1; deposit \$.55.

Composition, properties and uses of milk and its products, care and handling, fermentations, adulterations, modifications, ripening of cream for butter making. Manipulation of tests, manufacture of butter, cheese and frozen products. Lect. 2; lab. 1.

d. **Dairy Manufactures.** 1 Q. Winter. 3 cr. Fee \$1; deposit \$.50.

Factory methods of making butter, cheese, and frozen products; scoring and preparing them for market. Factory management and dairy accounts. Lect. 2; lab. 1.

Dairy (d) is elective for short course students during second quarter.

e. **Advanced Judging of Dairy Cattle.** 1 Q. Autumn. 2 cr.

The advanced judging of dairy cattle will include practice work and trips to dairy farms. Lect. 1; lab. 1.

Dairy (e) is elective for short course students during the first quarter.

ECONOMICS AND SOCIOLOGY.

PROFESSOR, J. M. HAMILTON (President).

- a. **Agricultural Economics.** 1 Q. Autumn. 3 cr.

A study of such agricultural economic problems as the value and rent of land, farm labor, rural credit, cooperative buying and selling. Lect. 3.

- b. **Rural Sociology.** 1 Q. Winter. 3 cr.

The social problems of the open country, rural health and sanitation, the country church, the rural school, the means of communication and transportation, libraries and recreations. Lect. 3.

ENGLISH.

PROFESSOR, J. H. HOLST.

- a. **English Exercises.** 2. Q. Autumn and winter. 8 cr. Mr. Holst, Miss Donaldson.

Practice in spelling, punctuation, note taking, letter writing, and the simpler forms of composition. Lect. 4.

- b. **English Composition.** 2 Q. Autumn and winter. 4 cr. Mr. Holst.

The paragraph and its development; the news item and short news story; business forms; practice in oral and written composition.

- c. **Composition and Literature.** 2 Q. Autumn and winter. 4 cr. Mr. Holst.

Oral and written exercises in narration, description, exposition and argumentation; current literature, use of the library.

- d. **Parliamentary Law.** 1 Q. Winter. 2 cr. Mr. Holst.

The principles of parliamentary law, the conduct of meetings, the organization of a society, the duties of officers, the recording of proceedings. The students will be given drill and actual practice. Lect. 2.

ENTOMOLOGY AND ZOOLOGY.

PROFESSOR, R. A. COOLEY.

- a. **Insect Pests.** 1 Q. Winter. 3 cr. Mr. Cooley.

Consideration of the more important insect pests of Montana and the means of their control. Lect. 3.

HISTORY.

ASSISTANT PROFESSOR, HELEN R. BREWER.

k. History of Industrial Education. 1 Q. Spring. 3 cr.

Educational epochs in the United States, relation between Educational advance and industrial progress, organized labor and educational progress, new educational policies as regards trade and industrial subjects. Lect. 3.

HOME ECONOMICS.

PROFESSOR, ALBA BALES. ASSISTANT PROFESSORS, CARLOTTA FORD, CECILE VAN STEENBERG. INSTRUCTOR, VICTORIA JORDAN.

a. Garment Making. 2 Q. Autumn and winter. 6 cr. Fee \$1. Miss Jordan.

Fundamental principles of hand and machine sewing applied to the making of aprons and undergarments. Students provide suitable materials. The finished work is the property of the student. Lab. 2 or 4.

b. Dressmaking. 2 Q. Autumn and winter. 7 cr. Fee \$1. Miss Van Steenberg.

Designing, cutting and making simple dresses.

c. Textiles. 1 Q. Autumn. 2 cr. Fee \$1.50.

Study of cotton, wool, silk, and linen, in regard to its microscopical structure, physical properties, manner of growth, and manufacture into cloth. Simple tests for adulteration. Lect. 1; lab. 1.

d. Dressmaking. 2 Q. Autumn and winter. 4 cr. Fee \$.50. Miss Van Steenberg.

e. Cooking. 2 Q. Autumn and winter. 4 cr. Fee \$2. Miss Ford. Lect. 1; lab. 2.

f. Home Nursing. 1 Q. Autumn. 2 cr. Miss Ford.

Care of sick, making beds, bathing, bandaging, emergencies, etc. Lect. 1; lab. 1.

g. Cooking. 2 Q. Autumn and winter. 8 cr. Fee \$3. Miss Ford.

Plain cooking, such as breads, meats, eggs, cereals, soups, salads, preserving fruits, cakes, candy and simple dessert. Visists to the meat market to study cuts of meat. Students are shown how biology and chemistry apply to the preparation of foods. Lect. 2; lab. 2.

h. Foods. 2 Q. Autumn and winter. 4 cr. Fee \$2.50. Miss Ford.

General principles of human nutrition. Some attention is given to invalid cookery. Lab. 2.

j. **Household Management.** 1 Q. Winter. 4 cr. Fee \$.50. Miss Jordan.

Expenditure of income, furnishing with reference to economy and efficiency, also the working out of a number of home problems by each member of the class. Lect. 3; lab. 1.

k. **Household Sanitation.** 1 Q. Autumn. 3 cr. Miss Jordan.

Care of the home from a sanitary standpoint. Source of water supply, and preservation of food. Lect. 2; lab. 1.

m. **House Planning and Decoration.** 1 Q. Autumn. 2 cr. Miss Jordan. Lect. 1; lab. 2.

HORTICULTURE.

PROFESSOR, O. B. WHIPPLE. ASSISTANT PROFESSOR, C. C. STARRING.

a. **Plant Propagation and Tree Planting.** 1 Q. Autumn. 4 cr. Fee \$1. Mr. Starring.

Plant propagation with special reference to the methods of multiplying fruit and planting of trees. The latter part of the course deals with simple principles of ornamental planting and ornamental plants, and the growing of trees adapted to Montana conditions. Lect. 4.

b. **Vegetable Gardening and Small Fruit Culture.** 1 Q. Winter. 3 cr. Mr. Starring.

Methods of growing, gathering, storing, and marketing the more important vegetable crops; hot bed construction and management; and the growing of such small fruits as the strawberry, raspberry, blackberry, currants, and gooseberry. Lect. 3.

c. **Fruit Growing.** 1 Q. Autumn. 3 cr. Prerequisite Horticulture a. Mr. Starring.

Selecting sites, planning and planting, cultivation, irrigation, pruning, and general care of the orchard, more especially from the standpoint of the home orchard. Lect. 3.

d. **Home Gardening.** 1 Q. Winter. 3 cr. Mr. Starring.

Elementary course dealing with the principles of plant propagation, vegetable gardening, small fruit culture, and ornamental gardening. Lect. 3.

MATHEMATICS.

PROFESSOR, W. D. TALLMAN. INSTRUCTORS, ANNIE BRENEMAN, FRIEDA BULL.

a. **Algebra.** 2 Q. Autumn and winter. 8 cr. Miss Breneman. Lect. 4.

b. **Advanced Algebra.** 1 Q. Autumn. 4 cr. Miss Bull.

Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional, zero.) radicals, etc. Lect. 4.

c. **Plane Geometry.** 2 Q. Autumn and winter. 8 cr. Prerequisite Mathematics a. Miss Breneman.

This includes in addition to the work given in the standard texts, a large number of original exercises. Lect. 4.

d. **Solid Geometry.** 1 Q. Spring. 4 cr. Prerequisites Mathematics b, c. Miss Breneman.

This course covers ordinary work in solid geometry with special attention to geometry of the sphere. Lect. 4.

e. **Shop Arithmetic.** 2 Q. Autumn and winter. 8 cr. Miss Breneman.

Designed to develop skill and accuracy in the fundamental processes of arithmetic. Problems will be chosen very largely of the type the student will actually encounter in connection with his mechanical work. Lect. 4.

f. **Industrial Arithmetic.** 1 Q. Autumn. 4 cr. Miss Breneman.

Fundamental processes of arithmetic related to home and farm experience. Mathematical problems connected with the work of the shop and laboratory. Lect. 4.

MECHANIC ARTS.

PROFESSOR, A. W. RICHTER (Dean). ASSISTANT PROFESSOR, R. T. CHALLENGER, F. C. SNOW. INSTRUCTORS, F. W. KATELY, F. HOMANN, J. C. PARK.

a. **Carpentry.** 2 Q. Autumn and winter. 4 cr. Fee \$2; deposit \$1. Mr. Challenger.

Use and care of carpentry tools. Series of exercises in joinery, followed by practice in framing and rafter and stair cutting. Lab. 2.

a1. **Carpentry.** 2 Q. Autumn and winter. 2 to 12 cr. Deposit \$4. Mr. Challenger.

Continuation of course (a) for those who wish to continue the work in carpentry. Lab. 1 to 6.

a2. **Cabinet Work.** 2 Q. Autumn and winter. 8 cr. Fee \$4; deposit \$4. Mr. Challenger.

Care of woodworking machines, of belts, bearings, and motors (gas engines and electric.) The sharpening and adjusting of knives and saws. Use of power machines in the running of stock, and the making of tables, doors, cupboards, book-cases, flour-bins, and similar work which is "built in" modern homes. Lect. 3; lab. 5.

b. **Forge.** 2 Q. Autumn and winter. 4 cr. Fee \$2; deposit \$2. Mr. Kately.

Care and manipulation of fire, iron, forging, including the operation of drawing, upsetting, pointing, bending, welding, calculation of stock; implement repairs, plow pointing, manufacture of chains, hooks, clevises, etc. Lab. 2.

b1. **Forge.** 2 Q. Autumn and winter. 2 to 12 cr. Deposit \$4. Mr. Kately.

Continuation of course (b) for those who wish to continue the work in forge. Lab. 1 to 6.

d. **Foundry.** 1 Q. Autumn. 2 cr. Fee \$1. Mr. Kately.

Bench and floor molding in green sand. Casting in white metal, brass, and cast iron are poured for use in the machine shop. Lab. 2.

d1. **Foundry.** 2 Q. Autumn and winter. 2 to 12 cr. Deposit \$4. Mr. Kately.

Continuation of course (d) for those who wish to continue the work in foundry. Lab. 1 to 6.

e. **Pattern Making.** 2 Q. Autumn and winter. 4 cr. Fee \$1. Mr. Challenger.

Allowances on pattern for draft, shrinkage and finish, construction of patterns for pulleys, hangers, machine parts and pipe fittings, and the necessary core boxes. Lab. 2.

f. **Machine Work.** 2 Q. Autumn and winter. 6 cr. Fee \$1; deposit \$1. Mr. Homann.

Bench work, including chipping, filing, scraping, fitting machine tool work on drill press, shaper, planer, and lathe. Lab. 2 to 4.

g. **Machine Work.** 2 Q. Autumn and winter. 4 cr. Fee \$1; deposit \$1. Mr. Homann.

Chipping and filing. Bench work in iron. Lab. 2.

h. **Machine Work.** 2 Q. Autumn and winter. 4 cr. Fee \$1; deposit \$1. Mr. Homann.

General machine work on drilling machines, shaper, planer, lathe and milling machine. Lab. 2.

h1. **Machine Work.** 2 Q. Autumn and winter. 2 to 12 cr. Deposit \$4. Mr. Homann.

General shop work, continuation of course (h) for those who wish to continue the work in machine shop. Lab. 1 to 6.

j. **Automobile Repair.** 2 to 12cr. Fee \$.50; deposit \$1 to \$6. Mr. Homann.

Construction and repair of the automobile. Lect. 1; lab. 1.

j1. **Automobile Repair.** 2 to 12 cr. Fee \$.50; deposit \$1 to \$6. Mr. Homann.

Men are trained for garage repair work or for the repair of their own cars. Work repairing engines, transmissions, differentials, electrical equipment, etc. Storage batteries, carburetors, vulcanizing, oxyacetylene welding. Lab. 2 to 12.

k. **Mechanical Drawing.** 2 Q. Autumn and winter. 4 cr. Mr. Challenger.

Elements of lettering; geometrical construction, isometric and orthographic representations, working drawings. Farm building construction, bills of material. Farm maps. Lab. 2.

m. **Mechanical Drawing.** 2 Q. Autumn and winter. 4 cr. Mr. Challenger.

Lettering. Geometrical Construction, freehand sketching of simple machine parts, reproduced in detailed working drawings; orthographic projection. Lab. 2.

n. **Mechanical Drawing.** 2 Q. Autumn and winter. 4 cr. Mr. Challenger.

Machine and architectural detail drawing, tracing and blue printing; isometric and cabinet projection; intersections and development of surfaces with applications in roof framing and sheet metal work. Lab. 2.

q. **Steam Boilers and Practice.** 2 Q. Autumn and winter. 10 cr. Fee \$1. Mr. Richter, Mr. Challenger, Mr. Park.

Three hours recitation and two periods practice per week. Lect. 3; lab. 2.

r. **Steam and Gasoline Engines.** 1 Q. Winter. 4 cr. Prerequisite Mechanic Arts a. Fee \$1; deposit \$1. Mr. Homann.

Construction and operation of steam and gasoline engines and tractors, valves and valve gears, governors; lubricators; indicator cards, indicated horsepower, brake horse power, efficiency. Lect. 2; lab. 2.

s. **Farm Motors.** 1 Q. Winter. 3 cr. Fee \$1; deposit \$1. Mr. Park.

Motors adapted to use on the farm, particularly the gas engine, with practice in operating and locating troubles. Tractor practice and study of simple stationary installations. Lect. 1; lab. 2.

t. **Electrical Practice.** 2 Q. Autumn and winter. 6 cr. Prerequisite Physics c. Fee \$1. Mr. Challenger.

Elementary principles of electricity, electric wiring, management and care of electrical machines and apparatus, including dynamos and motors, batteries, electric lights, telephones and telegraph apparatus. Lect. 2; lab. 1.

u. **Gas Engines and Gas Tractors.** 2 Q. Autumn and winter. 4 cr. Fee \$1; deposit \$1. Mr. Homann.

Operation, construction and repair of gasoline engines and gas tractors. Lect. 1; lab. 1.

v. **Leveling.** 2 Q. Autumn and winter. 4 cr. Mr. Snow.

Determination of slopes and distances. Measurement of plane areas. Lect. 1; lab. 1.

w. **Pipe Fitting and Plumbing.** 1 Q. Autumn or winter. 2 cr. Fee \$1; deposit \$1. Mr. Park.

Fitting of steam and gas pipe, exercises in plumbing, wiping joints. Lab. 2.

y. **Water Measurement.** 1 Q. Autumn or winter. 2 cr. Mr. Snow.

Measurement of water by means of weirs and current meters. Hydraulic rams. Small water power installations. Lect. 1; lab. 1.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN C. O. HEATH. INSTRUCTOR,

- a. **Military Science.** 2 Q. Autumn and winter. 2 cr.

Refer to military science courses in the college for a description of this work and the courses that follow.

- b. **Military Science.** 2 Q. Autumn and winter. 2 cr.

- c. **Military Science.** 2 Q. Autumn and winter. 2 cr.
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PHYSICAL EDUCATION.

MRS. UNA B. HERRICK (Dean). INSTRUCTOR, LORA MAXWELL.

- a. **Physical Education.** 2 Q. Autumn and winter. 2 cr.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics, German rhythmic dancing and games, Class exercises 2.

- b. **Physical Education.** 2 Q. Autumn and winter. 2 cr.

Athletics. Tennis, volley ball, basketball, indoor baseball, and recreational games, lectures and exercises.

- c. **Physical Education.** 2 Q. Autumn and winter. 2 cr.

Folk dancing. Recreational games. Class exercises 2.

PHYSICS.

PROFESSOR, F. W. HAM. INSTRUCTOR, ANNIE BRENEMAN.

- a. **Elementary Physics.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Mr. Ham. Fee \$1; deposit \$1.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound, heat, light, electricity and magnetism. Lect. 3; lab. 1.

- b. **Elementary Physics.** 1 Q. Autumn. 5 cr. Miss Breneman.

Experimental lectures, recitations, and assigned problems on mechanics, heat, light and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture. Lect. 5.

- c. **Elementary Physics.** 2 Q. Autumn and winter. 8 cr. Fee \$1; deposit \$1. Miss Breneman.

POULTRY HUSBANDRY.

PROFESSOR, W. F. SCHOPPE.

a. Farm Poultry. 1 Q. Autumn. 3 cr.

Various breeds and their adaptability to farm use. Housing, feeding, incubator and brooding. Judging birds, operating incubators and brooders. Lect. 1; lab. 2.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

a. Common Diseases of Animals. 2 Q. Autumn and winter. 8 cr.

A course for the stock owner, illustrating methods of diagnosis and treatment of the common ailments of domestic animals. First aid treatment of wounds and injuries; a brief course of instruction in obstetrical work and methods of handling cases of difficult parturition. Each division of the course is illustrated by actual cases as far as possible.

b. Infectious Diseases of Animals. 1 Q. Winter. 2 cr. Prerequisite Veterinary Science a.

A course dealing with the more important and common infectious diseases of animals. Diagnosis, methods of prevention, quarantine regulations, and disease eradication methods.

Summer Quarter.

Miss Daisy Forrest, County Superintendent of Schools of Gallatin County, has designated the Agricultural College Summer Quarter as her County Summer School and extends an invitation to other County Superintendents to hold a joint Summer School with her. The College will furnish the faculty and equipment, and will refund railroad fare under the terms stated elsewhere in the bulletin. Nine counties joined in this session last year and there is reason to hope for an increased number this year.

VOCATIONAL EDUCATION

Montana has accepted the provisions of the Smith-Hughes law, which provides for the training of teachers of vocations, and the department of Vocational Education is now a regularly organized department of the college. This department will offer strong courses which ought to appeal to teachers, supervisors, principals, and superintendents who wish to fit themselves for efficient participation in this vital movement in education.

LOCATION

The Gallatin Valley is noted for its ideal summer climate. It is never too warm to study. The beautiful campus and unexcelled surrounding are an inspiration to good work.

The courses of the Summer Quarter are designed primarily to experiment station grounds, with numerous fields and plots devoted to demonstration and research work, hold much of interest for the rural teacher. The state grain laboratory, state pure food laboratory, the soils laboratory, the college dairy, the greenhouses, and the poultry plant are a few of the interesting establishments found on the campus.

The Northern Pacific and Milwaukee railroads make Bozeman easily accessible from all parts of the state.

PURPOSE

The courses of the Summer Quarter are designed primarily to meet the needs of the rural teachers of Montana who are interested in making the school serve the community in a very definite way, and also to prepare teachers, supervisors, principals, and superintendents

who will work under the new Vocational Education law. Courses will be given in agriculture and industrial subjects, but what is of at least equal value, constructive planning for rural betterment through the agency of the school, will be emphasized.

We must look to the rural school for the general diffusion of agricultural knowledge. It is the duty of the Agricultural College not only to prepare teachers to meet examination requirements in agriculture, but also to give them the broader outlook which will enable them to apply that knowledge to the improvement of country life conditions through a due consideration of economic and social relations.

REGULAR COLLEGE COURSES

Many regular college courses will be given during the summer quarter. By taking advantage of the summer quarter regular college students can shorten the time required for graduation. College credit toward degrees will be given only to those who satisfy the regular entrance requirements.

PROFESSIONAL PREPARATION REQUIRED

"After July 1st, 1920, no person shall be given a regular certificate to teach who has not had at least twelve weeks of normal training work." This requirement can be met by attendance at two summer quarters.

AGRICULTURE MUST BE TAUGHT IN PUBLIC SCHOOLS

The law now requires that agriculture be taught in the public schools of the state and the State Board of Education has added that subject to the list of subjects required for a second grade teachers' certificate. The Agricultural College Summer Quarter will have the faculty and equipment to meet the requirements of the new law in the preparation of teachers.

ADMISSION

The courses are open to all persons who are qualified to pursue them to advantage.

CERTIFICATES AND CREDITS

Certificates of attendance and for courses satisfactorily completed will be issued to all who attend. Courses corresponding to those required for a teacher's certificate will, if satisfactorily completed, be entitled to certificate credit when approved by the Director of the Summer Quarter and the State Superintendent of Public Instruction.

THE ROUND TABLE

The round table discussions, which have been an interesting feature of the Agricultural Collège Summer Quarter, will be continued. At least three hours each week will be provided for the round table. Rural problems of general interest will be considered under the direction of capable leaders, selected from the faculty and students.

THE CONFERENCE HOUR

The faculty of the Summer Quarter will be men and women in intimate touch with rural problems. Several members are prominent leaders in rural school work, and they will appoint one hour each day for individual conferences. Experience has shown that many teachers welcome such an opportunity for direct personal assistance.

GENERAL ASSEMBLY

A general assembly will be held for twenty minutes each morning. This time will be given to announcements and to singing under the direction of the leader in community singing. A general assembly will also be held at 11 o'clock on Friday of each week, at which time visiting lecturers will be heard.

TEACHERS' APPOINTMENT COMMITTEE

The Summer Quarter will maintain an appointment committee to assist teachers in securing positions. The services of the committee are free to students and school officers.

LIBRARY

The college library will be open throughout the Summer Quarter and extensive classified list of bulletins, conveniently arranged, will be available for reading and reference. The attention of the rural teacher will be called to the vast amount of valuable information in bulletin form for free distribution, and directions and plans for its use will be given.

The Minimum List of Books for the Teachers' Library, the Reading Circle Books and many other professional works have been placed on the library shelves for the use of teachers.

RECREATION

Students will have the use of the college tennis courts and gymnasium. Outdoor games in which all are invited to take part will be encouraged and competent direction will be provided.

Week-end excursions will be made to beautiful Bridger canyon and the United States fish hatchery, to a highly developed rural community with its school and church, and industrial and social organization, and to other places of interest.

The mountains, canyons and trout streams near Bozeman invite wholesome recreation during recess from work.

EXCURSION THROUGH YELLOWSTONE PARK

At the close of the quarter the fifth annual excursion through the Yellowstone National Park will be made. From thirty to fifty teachers take advantage of this excursion every year, and it is accounted one of the most pleasant and profitable features of the quarter. Eight days are spent in the Wonderland of America. The conveyances and accommodations are first class and the total expense low.

Further information about the trip through the park will be furnished on application to the Director of the Summer Quarter.

EXPENSES

REGISTRATION

A registration fee of \$10.00 is required of all students. Any single course may be taken for a fee of \$5.00 and the laboratory fee, if there be any in connection with the course taken. Those taking a single course will not be entitled to any refund of railroad fare.

BOARD AND ROOM AT HAMILTON HALL.

Board and room for women at Hamilton Hall will cost \$40.00 for the session, or \$6.75 per week in advance in both cases. Hamilton Hall is a delightful home for college women, and the members of the Summer Quarter should look forward with pleasant anticipation to life there. Hamilton Hall will be ready for occupancy on the afternoon of June 22. A deposit of \$5.00 to apply on board should be sent in advance for a reservation.

THE BARRACKS.

Board and room for men will be furnished at the new barracks at \$40.00 for the session of six weeks. Board alone for men and women will be \$5.50 a week or \$30.00 for the session.

The Barracks are commodious and well equipped buildings, located on the campus. They will be ready for occupancy June 22.

REFUND OF RAILWAY FARE.

The University desires to make the opportunities for study afforded in the Summer Quarters equally accessible to all Montana teachers and students.

Therefore each regularly enrolled student who carries satisfactorily at least four hours of regular work for at least four weeks during the summer quarter will be entitled to receive, at the close of the session, a refund of the amount paid for the round trip railway fare less \$5.00. The amount of the refund will be based upon the cheapest route. The refund will not include the war tax. The railroad tax must be paid by the student. This refund cannot be made to teachers or students coming from points outside the state, or to anyone who has not secured the proper railway receipts.

SPECIAL COURSES FOR TEACHERS

AGRICULTURE

Teachers Courses

AMERICAN LITERATURE

EDUCATION

Elementary Psychology

Educational Psychology

Theory and Practice

Rural School Organization

Management and Relation to
the Community

GEOGRAPHY

HISTORY AND CIVICS

United States History

State and Federal Civics

Montana History

Montana School Law

HOME ECONOMICS

Rural School Lunches

HYGIENE AND SANITATION

MATHEMATICS

Rural Arithmetic

Mental Arithmetic

MANUAL TRAINING

Elementary Courses

Advanced Courses

PALMER PENMANSHIP

PUBLIC SCHOOL MUSIC

PUBLIC SCHOOL DRAWING

PLAYGROUND AND RECREATION

SPECIAL METHODS COURSES

Primary Methods

Reading in the Intermediate

Grades

Reading in the Grammar Grades

Language in the Intermediate

Grades

Language in the Upper Grades

History and Civics in the Inter-
mediate GradesGeography in the Intermediate
GradesGeography in the Grammar
Grades

ONE WEEK COURSES

Mental Measurements and Tests

Physical Education and Recrea-
tionRural School and Country Life
Problems

Current Educational Problems

PRACTICE SCHOOL

An ungraded practice school under the direction of Miss Pepple and Miss Knobel will be a prominent feature of the Summer Session

COLLEGE COURSES

Instructors are retained in the departments of—

Agriculture

Applied Art

Biology

Chemistry

English

Engineering

Home Economics

Mathematics

Secretarial Work

They will give work for which there is a sufficient demand.

Courses of Instruction.

Courses marked (*) may be taken for college credit.

ART

- S1. **Public School Drawing.** 2 cr. M. T. W. Th. F., at 9 and 11. Miss Baldwin.

Including pencil and crayon, water color, design in theory and practice, lettering, and paper cutting.

AGRICULTURE

- S1. **Agriculture for Teachers.** 2 cr. M. T. W. at 9, Th. F., at 1. Mr. Abbey.

A course in the fundamentals of agriculture and methods of teaching it. Phases of the subject which apply to Montana conditions will be emphasized. Class room discussions, lectures, laboratory exercises and the preparation of lesson plans.

EDUCATION

- *S1. **Elementary Psychology.** 2 cr. M. T. W. Th. F., at 2. Mr. Hamilton.

The principles of psychology presented so as to make them of practical use in the school room, materials and methods of modern psychology. This course will prepare for the teacher's examination.

- S7. **Theory and Practice of Teaching.** 2 cr. M. T. W. Th. F. Miss Knobel.

This will include a study of the aims of education, the fundamentals of teaching, the recitation, class management, and the use of scales.

- S2. **Rural School Organization and Management.** 2 cr. M. T. W. Th. F., at 9. Miss Pepple.

The program, records, alterations. The relation of the home and school through the application of the course of study. The relation of the home and school through extra mural activities. Home study and occupations.

*S3. **Educational Measurements.** 2 cr. M. T. W. Th., at 11. F. at 4. Miss Wilson.

The value of educational tests. Methods of testing. Demonstrations and practice. The recording and use of data.

S4. **History of Education.** 2 cr. M. T. W. Th. F., at 2. Mr. Holst.

A brief history of modern education. The development of the public school system in the United States.

HISTORY AND CIVICS

S1. **Montana History.** 1 cr. M. W. F., at 1. Mr. Hamilton.

A study of such important events as the Lewis and Clark expedition, the fur traders, the early missionaries, Stevens' explorations, the pioneers and gold discoveries, Indian campaigns, railroads, the cattle country, etc. The library has an abundance of reference material and the lectures will be illustrated with lantern slides.

S2. **Montana School Law.** 1 cr. M. T. W., at 11. Miss Davis.

The whole subject of school law with special attention to the duties of the teacher as an officer of the state; school boards, care of property, contracts, records and reports.

HOME ECONOMICS

S1. **Rural School Lunches.** 2 cr. Fee \$1.50. M. T. W. Th. F., at 1. Miss Jordan.

The actual preparation of dishes suitable for rural school lunches and a study of the means of preparing the hot dish in the schools. So far as possible this will be done in a school room like a rural school room, rather than in an equipped cookery laboratory, and only such utensils will be used as might be furnished in the rural school.

HYGIENE AND SANITATION

S1. **Hygiene and Sanitation.** 1 cr. M. W. F., at 8. Miss Wylie.

The character and location of the farm house, barns and wells. Drainage, the water supply; sources and modes of infection. Sanitary conveniences, ventilation, personal hygiene. The State Courses of Study in Hygiene.

LITERATURE

S1. **American Literature.** 2 cr. M. T. W. Th. F., at 1. Miss Wylie.

A review course.

MATHEMATICS

S1. **Rural Arithmetic.** 2 cr. M. T. W. Th. F., at 10.

A consideration of the adaptability of the various rural arithmetics. The methods and subject matter necessary to relate the teaching of arithmetic to other subjects and to the farm and home. The solution of various classes of problems.

MECHANIC ARTS

S1. **Manual Training.** 2 cr. Fee \$1.50. M. T. W. Th. F., at 10 to 12. Mr. Challenger.

The work this year will be devoted to practical drawing, lettering, the use and care of tools, and a series of exercises in joining.

S2. **Advanced Course in Manual Training.** 2 cr. Fee \$1.50. M. T. W. Th. F. Mr. Challenger.

Consideration of the minimum equipment for the rural school practical problems of direct interest; subjects and materials; specific plans, the making of model articles. A course for teachers who have had little or no experience with wood work in the school.

MUSIC

S1. **Public School Music.** 2 cr. M. T. W. Th. F., at 8. Mr. Currier.

The first twenty minutes each morning will be devoted to singing by the assembled students, and the class in music will receive instruction during the remainder of the hour in sight singing, ear training, notation, child voice, rote songs, and methods of teaching.

PIANO AND VOCAL MUSIC

Students of the Summer Session may pursue individual study in singing with Mr. Currier, or in piano with Miss Hollier. Tuition for the summer session, two half hour lessons weekly: Voice, with Mr. Currier, \$15.00; Piano, with Miss Hollier, \$12.00. Students may have the use of the college practice pianos at the rate of \$1.50 for one hour daily through the session.

PHYSICAL EDUCATION

S1. Play and Recreation. 2 cr. M. T. W. Th. F., at 4. Miss Maxwell.

The organization of activities. Corrective gymnastics. The practical teaching of games, which appeal to boys and girls, emphasized. A comprehensive list of fundamental exercises (without apparatus), requiring activity and agility rather than strength alone, developed. Athletics, simple folk dances, games, drills and sports taught (1) as an aid in the development of boys and girls, (2) to give zest and variety to the school room work. Theory and methods.

SPECIAL METHODS COURSES

- S1. Primary methods. Fee \$1.
- S2. Reading in the Intermediate Grades.
- S3. Reading in the Grammar Grades. Miss Davis.
- S4. Language in the Intermediate Grades. Miss Wilson.
- S5. Language in the Grammar Grades. Miss Davis.
- S6. History and Civics in the Intermediate Grades.
- S7. United States History. Mr. Ketcham.
- S8. State and Federal Civics. Mr. Ketcham.
- S9. Geography in the Intermediate Grades.
- S10. Geography in the Grammar Grades. Miss Wilson.
- S11. Palmer Penmanship. Mr. Erickson.

Roster

OF COMMANDANT, CADET OFFICERS AND CADET NON-COMMISSIONED OFFICERS.

COMMANDANT

Heath, C. O.....Professor of Military Science and Tactics

ASSISTANT

BATTALION STAFF

Ecton, Zales.....Captain and Adjutant, Acting Assistant
Ellingson, Henry J.....Captain and Quartermaster

COMPANY A

Officers

Bradford, Loren O.....Captain
Finlayson, Max T.....First Lieutenant
Sheffield, Dale.....Second Lieutenant

Non-Commissioned Officers

McFarlin, George C.....First Sergeant
Bowen, Lowell E.....Sergeant
Schurch, Edward C.....Sergeant
McRoberts, Lewis.....Sergeant

COMPANY B

Officers

Mabee, William B.....Captain
Schneider, August M.....First Lieutenant
Weber, Bryan J.....Second Lieutenant

Non-Commissioned Officers

Sayers, Leon D.....First Sergeant
Dawes, Robert E.....Sergeant
Durkee, Lindley R.....Sergeant
Barrows, Thomas E.....Sergeant

Register of Students

1918-1919.

GRADUATE STUDENTS

GRADUATES NOT CANDIDATES FOR DEGREES

Brewer, Grace L.....	Secretarial	Bozeman
Copeland, Arthur J.....	Agronomy	Bozeman
Fraser, Mac.....	Civil Engineering.....	Terry
Luther, Edith.....	Botany and Bacteriology.....	Choteau
Nutting, Grace Bingham.....	Botany and Bacteriology.....	Litetz, Pa.

COLLEGE STUDENTS

SENIORS

Axtell, Lucy Alice.....	Applied Art.....	Belgrade
Baker, Ada Damaris.....	Secretarial.....	Columbia Falls
Bunnell, Marie.....	Home Economics.....	Bozeman
Chattin, Lynnie.....	Home Economics.....	Big Timber
Chattin, Earl William.....	Agronomy.....	Big Timber
Cooley, George.....	Animal Husbandry.....	Bozeman
Davidson, Paul Ballinger.....	Chemistry	Bozeman
Davis, Russell Lowell.....	Animal Husbandry.....	Bole
Eames, Esther Minnie.....	Home Economics.....	Canyon Ferry
Erwin, James Kent.....	Electrical Engineering.....	Bozeman
Fitzgerald, James.....	Mechanical Engineering.....	Bozeman
Graves, Nelson Fisk.....	Animal Husbandry.....	Whitehall
Gray, William David.....	Industrial Chemistry.....	Choteau
Greene, Gladys Leckliter.....	Applied Art.....	Salesville
Haynes, Etta V.....	Home Economics.....	Clancy
Humphrey, Leo Chandler.....	Industrial Chemistry.....	Holyoke, Mass.
Ingram, Doris.....	Home Economics.....	Helena
Jacoby, George F.....	Architectural Engineering.....	Helena
Jones, Neil A.....	Agricultural Education.....	Mazeppa, Minn
Kearns, Katherine.....	Home Economics.....	Townsend
Kelley, Jean.....	Animal Husbandry.....	Anaconda
Knott, Georgia Frances.....	Home Economics.....	Heron
Linfield, Azalea R.....	Home Economics.....	Bozeman
Mabee, William Bruce.....	Entomology and Zoology.....	Glasgow
McElwee, James.....	Electrical Engineering.....	Bozeman
McVey, Chester Lee.....	Electrical Engineering.....	Portland, Ore
Mills, Dorothy Canning.....	Home Economics.....	Helena

Monforton, Lucile.....	Home Economics.....	Salesville
Muntzer, Henry Philip.....	Electrical Engineering.....	Butte
Noble, Daniel Bohan.....	Agronomy.....	Whitehall
Norcutt, Etta Viola.....	Home Economics.....	Denton
Norris, Earl.....	Industrial Chemistry.....	Helena
Perring, Maude Virginia.....	Home Economics.....	Salesville
Potter, Charles Edward.....	Agricultural Education.....	Bozeman
Prentiss, Earl Harry.....	Electrical Engineering.....	Hamilton
Reitz, Harold John.....	Electrical Engineering.....	Terry
Scott, Samuel.....	Industrial Chemistry.....	Butte
Seeley, Evelyn G.....	Secretarial.....	Bozeman
Senz, Melvin John.....	Electrical Engineering.....	Terry
Smith, Robert Bashford.....	Agricultural Education.....	Bozeman
Solberg, Stella.....	Home Economics.....	Big Timber
Stanley, Ernest.....	Animal Husbandry.....	Whitehall
Stone, Mary Louise.....	Home Economics.....	Bozeman
Taylor, Horace Dale.....	Animal Husbandry.....	Bozeman
Waterman, Marie L.....	Home Economics.....	Bozeman
Werre, Harold Moritz.....	Animal Husbandry.....	Bozeman

JUNIORS

Alderson, Priscilla.....	Applied Art.....	Bozeman
Bush, Elmer Joseph.....	Civil Engineering.....	Pony
Carroll, Charles P.....	Electrical Engineering.....	Dillon
Dickman, Herman Louis.....	Agronomy.....	Truly
Ecton, Zales.....	Secretarial.....	Manhattan
Flynn, Jesse Charles.....	Electrical Engineering.....	Logan
Green, Ruth M.....	Botany and Bacteriology.....	Belgrade
Hagen, Paul Joseph.....	Animal Husbandry.....	Glendive
Hall, Genevieve.....	Home Economics.....	Bozeman
Harris, Vera B.....	Home Economics.....	Bozeman
Henry, Forrest Gleason.....	Electrical Engineering.....	Townsend
Herriott, Evelena Ara.....	Home Economics.....	Thompson Falls
Holden, Zaydah A.....	Home Economics.....	Bozeman
Hollier, Trena.....	Home Economics.....	Bozeman
Hollier, Myrtle.....	Home Economics.....	Bozeman
Kohnen, John.....	Civil Engineering.....	Great Falls
Kyle, Frances.....	Home Economics.....	Bozeman
Larse, Victor Fridtjof.....	Agronomy.....	Plains
Lease, Helen Elizabeth.....	Home Economics.....	Great Falls
Linfield, Leila Mary.....	Applied Art.....	Bozeman
McConnell, Grant.....	Civil Engineering.....	Helena
McCracken, Lucile Virginia.....	Secretarial.....	Livingston
McLaughlin, Eugene.....	Chemistry.....	Billings
Marquis, Minnie-Ellen.....	Home Economics.....	Bozeman
Mashin, Ladimir.....	Animal Husbandry.....	Chicago, Ill.
Michel, Henry.....	Electrical Engineering.....	Bozeman

Millegan, Mary Esther.....	Chemistry	Eureka
Oberle, Henry.....	Electrical Engineering.....	Bozeman
Pickens, Russel Marion.....	Chemistry	Huntley
Pitts, Raymond Benton.....	Entomology and Zoology.....	Bozeman
Rogers, Sara Agnes.....	Home Economics.....	Kilborn
Roney, Clyde Ellis.....	Electrical Engineering.....	Missoula
Rowe, Forrest.....	Animal Husbandry.....	Pasadena, Calif.
Smith, Stephen Edward.....	Agronomy	Bozeman
Snyder, Bess Irene.....	Home Economics.....	Clarion, Pa.
Stark, Albert.....	Industrial Chemistry.....	Livingston
Stewart, Harold.....	Secretarial	Bozeman
Steel, Frederick Kippen.....	Electrical Engineering.....	Great Falls
Sullivan, Ella Delphine.....	Home Economics.....	Townsend
Switzer, Florence.....	Entomology and Zoology.....	Bozeman
Tobey, Willard Herbert.....	Animal Husbandry.....	Highwood
Tyler, John Luck.....	Industrial Chemistry.....	Nashville, Tenn.
Whitacre, Gladys M.....	Home Economics.....	Choteau

SOPHOMORES

Baker, Alfred Leroy.....	Animal Husbandry.....	Whitehall
Beauchamp, Pearl Edith.....	Home Economics.....	Bozeman
Belknap, Jess Willard.....	Animal Husbandry.....	Polson
Bowen, John.....	Agronomy	Worden
Bowen, Lowell Emery.....	Architectural Engineering.....	Butte
Bradford, Loren O.....	Architectural Engineering.....	Livingston
Burgess, Marjorie May.....	Home Economics.....	Bozeman
Carey, Helen Margaret.....	Secretarial	Polson
Carmichael, Mable Esther.....	Home Economics.....	Butte
Dawes, Robert Earl.....	Electrical Engineering.....	Bozeman
Ditty, Ethel Winifred.....	Applied Art.....	Lewistown
Drummond, Lillian Helen.....	Secretarial	Terry
Durkee, Lindley Rathbun.....	Architectural Engineering.....	Polson
Egan, Mayme Ursula.....	Applied Art.....	Butte
Ellingson, Henry Joseph.....	Electrical Engineering.....	Big Timber
Finlayson, Max Theobald.....	Chemistry	Livingston
Flannagan, Mary Catherine.....	Home Economics.....	Anaconda
Forbes, Frances E.....	Home Economics.....	Helena
Forbes, Ruth Louise.....	Secretarial	Helena
Gilman, Vergle Day.....	Secretarial	Bozeman
Graves, Leonard Templeton.....	Secretarial	Polson
Hall, Bernice.....	Secretarial	Bozeman
Harner, Clara.....	Home Economics.....	Belt
Hart, Glenn.....	Electrical Engineering.....	Harlowton
Hill, Helen Maxine.....	Home Economics.....	Great Falls
Hodgkiss, Grant Henry.....	Electrical Engineering.....	Choteau
Holderby, Josephine.....	Industrial Chemistry.....	Bozeman
Hollingsworth, Harley William.....	Architectural Engineering.....	Mornburg, Ia

Hunt, Gerald Marshall	Secretarial	Bozeman
Johnson, Edith	Botany and Bacteriology	Lewistown
Kingsbury, Emily Celeste	Secretarial	Butte
Kelley, Earl James	Electrical Engineering	Bozeman
Lillard, John Jordan	Secretarial	Bozeman
Loney, Sterling Melvin	Electrical Engineering	Hardin
Mabee, Helen Victoria	Entomology and Zoology	Glasgow
McConnell, Robert	Horticulture	Lewistown
McFarlin, George Clark	Animal Husbandry	Butte
McRoberts, Lewis Henry	Industrial Chemistry	Bozeman
Mahan, Rubietta	Home Economics	Anaconda
Moebus, Henrietta Catherine	Home Economics	Butte
Moen, Leonard Willard	Mechanical Engineering	Culbertson
Niemi, Leonard	Mechanical Engineering	Red Lodge
Noble, Ruth Elizabeth	Secretarial	Whitehall
Ohlin, Enoch T.	Mechanical Engineering	Huntley
Oleinik, Joseph	Civil Engineering	Bear Creek
Oleinik, John	Botany and Bacteriology	Bear Creek
Pinckney, Alvin Joseph	Industrial Chemistry	Beemer, Nebr.
Pool, Gussie	Botany and Bacterology	Townsend
Potter, Earl Francis	Industrial Chemistry	Bozeman
Ravet, Elizabeth	Home Economics	Bozeman
Sayers, Leon David	Chemistry	Bozeman
Schneider, August Mills	Mechanical Engineering	Helena
Schurch, Edward C.	Electrical Engineering	Deer Lodge
Sheffield, Dale	Mechanical Engineering	Billings
Stanley, Edith Mary	Secretarial	Whitehall
Sutherland, Sidney Samson	Secretarial	Polson
Sweat, Helen	Nurses' Course	Dutton
Thompson, Stewart McKinley	Electrical Engineering	Great Falls
Tripp, Helen Louise	Home Economics	Butte
Ware, Frank	Industrial Chemistry	Calabar
Waterman, Evelyn Pauline	Secretarial	Bozeman
Weber, Bryan Joseph	Mechanical Engineering	Helena
Wesch, Florence Chrystine	Home Economics	Billings
Whitaker, Gladys	Home Economics	Choteau
Wiles, Glenn Dewey	Chemistry	Columbia Falls
Wilson, Donald Alfred	Chemistry	Forsyth
Wise, Howard Willis	Mechanical Engineering	Hardin

FRESHMEN

Alexander, Ann Adrian	Applied Art	Three Forks
Alquist, Merrill Kenneth	Mechanical Engineering	Conrad
Aitken, Florence Rose	Entomology and Zoology	Bozeman
Bachman, Lester	Mechanical Engineering	Grantsdale
Becker, Norma Lena	Secretarial	Bozeman
Benbow, Dorothy	Home Economics	Columbus

Bennett, William Jonathan.....	Industrial Chemistry.....	Anaconda
Bentall, Frank Maurice.....	Mechanical Engineering.....	Hathaway
Bishop, Wendell Murray.....	Agriculture.....	Anaconda
Bogy, Tom Vital.....	Electrical Engineering.....	Chinook
Bohart, Marjory Ellen.....	Entomology and Zoology.....	Wilsall
Bole, Elizabeth.....	Chemistry.....	Bozeman
Bolles, Henry Jason.....	Civil Engineering.....	Gilbert, Iowa
Bonn, Fred Louis.....	Mechanical Engineering.....	Bozeman
Border, Evelyn.....	Home Economics.....	Bozeman
Bowen, David.....	Industrial Chemistry.....	Worden
Bright, Kenneth Alfred.....	Electrical Engineering.....	Terry
Briner, Ethel.....	Secretarial.....	Big Timber
Brook, Mary Isabel.....	Home Economics.....	Judith Gap
Brown, Wesley.....	Secretarial.....	Browning
Burgess, Aline Natalie.....	Secretarial.....	Bozeman
Burley, Arthur.....	Secretarial.....	Park City
Buzard, Leonora Lila.....	Secretarial.....	Bozeman
Buzard, Marion Frances.....	Home Economics.....	Bozeman
Cameron, Fred Herbert.....	Agriculture.....	Terry
Chauner, Lillian Belle.....	Secretarial.....	Bozeman
Chesley, Rose Mildred.....	Secretarial.....	Hobson
Chestnut, Ben Howard.....	Mechanical Engineering.....	Anaconda
Chaplin, Hazel Lucille.....	Secretarial.....	Pony
Clark, Ella Louise.....	Home Economics.....	Bozeman
Cleland, Vera Ernestine.....	Home Economics.....	Hardin
Cline, Beatrice Marie.....	Secretarial.....	Bozeman
Clinkenbeard, Opal.....	Home Economics.....	Great Falls
Coffey, Lady Eulalia.....	Home Economics.....	Bozeman
Conklin, Melvin.....	Industrial Chemistry.....	Oswego
Cooley, Elizabeth Content.....	Home Economics.....	Bozeman
Cooley, Charlotte Packard.....	Applied Art.....	Bozeman
Cottingham, Edward Basil.....	Chemistry.....	Helena
Courtney, Robert Dewey.....	Electrical Engineering.....	Harrison
Cox, Chloe.....	Home Economics.....	Ballantine
Crowley, Chas. John.....	Agriculture.....	Lewistown
Cruzen, Fred Tyseling.....	Electrical Engineering.....	Havre
Curl, Mary Margaret.....	Home Economics.....	Gardiner
Davidson, Hazel.....	Home Economics.....	Townsend
Davison, Gladys Adelaide.....	Home Economics.....	Meteetse, Wyo.
Dean, Richard Howell.....	Industrial Chemistry.....	Manhattan
Degenhart, Frank Hugo.....	Electrical Engineering.....	Philipsburg
DeVore, Lloyd Grant.....	Agriculture.....	Been
Dougherty, James.....	Industrial Chemistry.....	Anaconda
Eberhart, Savallah Marie.....	Applied Art.....	Bozeman
Eckley, Mary Louise.....	Secretarial.....	Ronan
Ellis, Harry Vernon.....	Electrical Engineering.....	Absarokee
Erdman, Wilson.....	Electrical Engineering.....	Libby
Everett, Maryfrances.....	Applied Art.....	Livingston

Farnum, Ernest Charles	Agriculture	Harlem
Fenton, Stanley John	Agriculture	Hardin
Field, Ida Bertina	Secretarial	Lovejoy
Field, Inez	Home Economics	Lovejoy
Forrest, Mildred Lois	Secretarial	Choteau
Fulmer, Harry Wilbur	Electrical Engineering	Billings
Gagle, Roy Hulse	Mechanical Engineering	Hobson
Galliher, Vera Alice	Secretarial	Crow Agency
Garven, Fenimore Wm.	Electrical Engineering	Fishtail
Gaston, Jorene	Secretarial	Havre
Giffin, Mildred	Home Economics	Helena
Glinecki, Florian	Electrical Engineering	Helena
Gordon, Alice Cravath	Secretarial	Lambert
Hagaman, John	Civil Engineering	Fishtail
Hagen, Edward	Civil Engineering	Havre
Harding, Ruth Jane	Secretarial	Billings
Harrer, Ruth Warren	Home Economics	Belgrade
Harrington, Cornelius Emmett	Electrical Engineering	Butte
Hartz, Esther Margaret	Secretarial	Davenport, Ia.
Hauseman, Dean	Secretarial	Virginia City
Hereim, Elida Christine	Secretarial	Lennepe
Herrett, Fred Emerson	Agriculture	Bozeman
Herron, Miriam	Home Economics	Bozeman
Hibbert, Norman William	Agriculture	Chicago, Ill.
Higgins, Mae Crosby	Secretarial	Ringling
Holderby, Jesse Mathews	Industrial Chemistry	Bozeman
Holliday, Minor Tyndall	Civil Engineering	Havre
Holland, Dorothy Ann	Secretarial	Havre
Holmesland, Helen Marie	Applied Art	Sun River
Howard, Ruby	Secretarial	Bozeman
Jacob, Sadie Thomas	Home Economics	Helena
Jeffries, Bess O.	Home Economics	Missoula
Johns, Ernest Wayne	Secretarial	Wilsall
Jones, Ada Ruth	Secretarial	Bozeman
Jones, Wilma	Home Economics	Bynum
Jorgenson, Arthur R.	Electrical Engineering	Helena
Judd Marlyn Elizabeth	Secretarial	Butte
Keown, Kathryn	Chemistry	Bozeman
Kenck, Ralph Edward	Agriculture	East Helena
King, Joseph	Secretarial	Lewistown
Kleven, Minnie	Secretarial	Bozeman
Kruger, Arnold Reinhardt	Agriculture	Plains
LaBartew, Mabel	Secretarial	Bozeman
Lewis, Helen	Home Economics	Howard
Lindsley, Marguerite	Chemistry	Yellowstone Park, Wyo.
Luther, Merrill Kenneth	Chemistry	Choteau
McKee, Anna Margaret	Secretarial	Jeffers
MacHatton, Robert	Civil Engineering	Great Falls

Mathew, Emmet Sheridan.....	Industrial Chemistry.....	Bozeman
Mathew, Hollis.....	Industrial Chemistry.....	Bozeman
Mathews, Gladys Mary.....	Secretarial	Havre
Miller, Hutoka Mae.....	Home Economics.....	Bozeman
Mink, Leon Delmont.....	Industrial Chemistry.....	Huntley
Moriarity, James Milton.....	Electrical Engineering.....	Great Falls
Morrison, Arthur Lawrence.....	Industrial Chemistry.....	Bridger
Mortin, Clarence August.....	Agriculture	Bozeman
Munson, Arthur Milton.....	Electrical Engineering.....	Clancy
Muntzer, Theodosia Valentine.....	Home Economics.....	Butte
Nelson, Zelma.....	Home Economics.....	Dillon
Nichols, Marjory Estelle.....	Chemistry	Bozeman
Noble, Dorothy Altha.....	Home Economics.....	Great Falls
Noble, Noneeta Leona.....	Secretarial	Great Falls
Norton, Ruth.....	Home Economics.....	East Helena
Olson, Elmer Richard.....	Civil Engineering.....	Alberton
Omta, Anna Margaret.....	Secretarial	Bozeman
Page, Lester Ray.....	Secretarial	Trotters, N. D.
Peterson, Alton Leroy.....	Secretarial	Culbertson
Peterson, Millard.....	Chemistry	Culbertson
Pietsch, Lloyd Charles.....	Agriculture	Bozeman
Pinckney, Mary A.....	Secretarial	Bozeman
Pollod, Andrew Edmond.....	Electrical Engineering.....	Great Falls
Pouder, Oliver.....	Electrical Engineering.....	Billings
Pound, Rupert Earl.....	Electrical Engineering.....	Gardiner
Rabe, Hazel Helen.....	Secretarial	Bozeman
Reed, Dorothy Marion.....	Home Economics.....	Windham
Richards, Albert Baker.....	Electrical Engineering.....	Gibson
Ritschel, Eva.....	Home Economics.....	Wisdom
Roberts, Jennie.....	Applied Art.....	Bozeman
Robertson, Eugene.....	Chemistry	Bozeman
Rohrer, Mildred Alberta.....	Secretarial	Bozeman
Rothwell, Craig Selby.....	Electrical Engineering.....	Columbus
Russell, Marion Jeanette.....	Secretarial	Hardin
Russell, Thomas F.....	Agriculture	Bozeman
Ryan, Ambrose.....	Electrical Engineering.....	Great Falls
Sabin, George Theodore.....	Electrical Engineering.....	Hedgesville
Sabin, Ora K.....	Home Economics.....	Hedgesville
Sackett, Nona Elzina.....	Home Economics.....	Billings
Scherer, Christopher.....	Chemistry.....	Brookville, Ind.
Schreibes, Edna.....	Home Economics.....	Sheridan, Wyo.
Sears, Thos. Housson.....	Secretarial	Bozeman
Shoebotham, Thomas Bruce.....	Civil Engineering.....	Huntley
Sjoberg, Elizabeth Augusta.....	Secretarial	Sidney
Smith, Arvella.....	Secretarial	Bozeman
Sperling, Genevieve Blanche.....	Home Economics.....	Townsend
St. Clair, Ward Kent.....	Electrical Engineering.....	Glasgow
Stearns, William Brayton.....	Chemistry.....	Great Falls

Stranahan, Mary Jeanette.....	Chemistry	Havre
Street, Joseph Dewey.....	Secretarial	Bozeman
Story, Katherine.....	Chemistry	Bozeman
Terwilliger, Nina.....	Secretarial	Livingston
Todd, Harold.....	Agriculture	Bozeman
Trackwell, Rosemary.....	Home Economics.....	Highwood
Tretsven, Oscar.....	Agriculture	Bozeman
VanHouten, Elton.....	Electrical Engineering.....	Hardin
Waite, Janice Ramona.....	Secretarial	Bozeman
Walker, Ruby Alma.....	Home Economics.....	Bridger
Wells, Dana.....	Secretarial.....	Park City
Wildman, Herbert.....	Secretarial	Knowlton
Williams, Jessie Iona.....	Home Economics.....	Como
Wilton, June Erma.....	Secretarial	Bozeman
Winter, Alexander.....	Chemistry	Bozeman
Wccasek, Frances Josephine.....	Applied Art.....	Great Falls
Wolfe, Donald.....	Architectural Engineering.....	Bridger
Wood, Romaine R.....	Secretarial	Carthage, Mo.
Wylie, Paul.....	Agriculture	Bozeman
Young, Ethel Ellen.....	Secretarial	Bozeman

SECONDARY STUDENTS

School of Agriculture

THIRD YEAR

Barrows, Thomas Eugene.....	Fort Benton
Beach, Raymond Robert.....	Florence
Cheney, Clark.....	Twin Bridges
Goldberg, Clarence.....	Jens
Graeber, James.....	Winifred
Martinell, Paul R.....	Dell
Newman, Ernest.....	Heron

SECOND YEAR

Berg, Henry Elbert.....	Progress
Buttelman, John George.....	Willow Creek
Buttelman, William.....	Willow Creek
Cameron, Walter.....	Helena
Dayton, Carl.....	Stevensville
Edwards, Harry.....	Monarch
Eggen, Charles.....	Absarokee
Gordon, George S.....	Iron Springs, Alberta
Hubble, Lorris.....	Coeur d'Alene, Idaho
Montgomery, Alva.....	Hardin
Newton, Wesley Howard.....	Roundup

Rorvik, Allen.....	Circle
Rouse, Harold Grant.....	Three Forks
Scott, Victor H.....	Fort Benton
Williams, Earl Lorenzo.....	White Sulphur Springs

FIRST YEAR

Barrows, Willard.....	Fort Benton
Cooper, Howell Raymond.....	Willow Creek
Cox, John.....	Fort Benton
Dover, Albert L.....	Buffalo
Dunnigan, William.....	Anacorda
Hobbs, Isaac.....	Elgin
Jones, Maurice.....	Fresno
Lish, Bert.....	St. Ignatius
Macdonald, William E.....	Geraldine
Malcolm, Alexander.....	Pray
Quist, Clair.....	Wisdom
Scott, William.....	Fort Benton
Short, Don Livingston.....	Medora, N. D.
Swenson, Erling Magnus.....	Helena
Wisner, Fitz Albert.....	Garrison

School of Home Economics

THIRD YEAR

Wood, Rosalie Nell.....	Stevensville
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SECOND YEAR

Berg, Elsie Marie.....	Progress
Goldberg, Alice Victoria.....	Jens
Gordon, Gladys Atmore.....	Lethbridge, Alta.
Reese, Esther Mary.....	Belgrade
Stow, Alice.....	Stearns

FIRST YEAR

Berg, Gudruda.....	Progress
Bircher, Christina.....	Miles City
Ferguson, Inez.....	Columbus
Lippert, Ruby Elizabeth.....	Townsend
Lynes, Hazel R.....	Billings
Steeple, Hilda.....	Froid
Weaver, Rose Frances.....	Belgrade

School of Mechanic Arts

SECOND YEAR

Brown, James A.	Box Elder
Hockersmith, Maurice	Sun River
Parkhurst, L. C.	Browning
Stark, Louis Bothy	Neihart
Stow, George	Great Falls
Williams, Orville Goldie	Bozeman

FIRST YEAR

Ayers, Chester Arnold	Cameron
Bowen, Albert O.	Wilsall
Brost, John Nicholas	Nashua
Carpenter, George William	Logan
Christopherson, Henry Albert	Hobson
Combs, William A.	Billings
Dalziel, William	Floweree
Darnall, Glenn	Neihart
Deskin, James	Bozeman
Dickinson, Christopher	Great Falls
Eggen, Oscar Bernhardt	Absarokee
Faller, Carl Goodwin	Neihart
Heidelman, John Paul	Dixon
Hereim, Christen Norman	Lennepe
Holmesland, S. J.	Sun River
Hughes, James E.	Bozeman
Hughes, Walter A.	Cascade
Hunt, Robert A.	White Sulphur Springs
Jellison, Robert Lyle	Billings
Jones, Valens	Bozeman
Keil, Louis Elmer	Belgrade
Keil, Robert Marshal	Belgrade
Kieckbusch, William	Townsend
Laidlaw, Ethan Allen	Butte
Liddell, Peter	Anaconda
Luther, Herman Martin	Great Falls
MacCallum, Gerald Cushing	Anaconda
Macauley, Frances K.	Benchland
McGowan, Frank D.	Hall
Mackel, Norris	McAllister
McMahon, Willis	Anaconda
Megee, Ellison Richard	Bozeman
Munge, Edward R.	Helena
Newhall, Chandler	Loma
Nichausen, Ralph	Cardwell

Nichols, Edmund.....	Billings
Nicklawske, James M.....	Benchland
Nixon, Clifford Young.....	Salesville
Page, James Annin.....	Twin Bridges
Pasha, Herbert Ronald.....	Bozeman
Ravet, John H.....	Bozeman
Seel, Otto M.....	Mondak
Shular, Clifford.....	Anaconda
Scmmers, Melvin Earl.....	Twin Bridges
Staats, Harvey Louis.....	Bozeman
Sullivan, J. Kress.....	Butte
Theston, Thomas L.....	Ennis
Thompson, Thomas Edward.....	Alberton
Todd, Ohmer Linel.....	Bozeman
Veseth, Carl.....	Malta
Voyce, George H.....	Mossmain
Whitmore, Fred.....	Gilman
Willson, Virgil.....	Virgelle
Winterrowd, Irven Wayne.....	Cascade

MUSIC STUDENTS

Aitken, Florence Rose.....	Voice	Bozeman
Alderson, Priscilla.....	Voice, Violin.....	Bozeman
Axtell, Lucy Alice.....	Voice	Belgrade
Baker, Ada Damaris.....	Voice	Columbia Falls
Bircher, Christine.....	Piano	Miles City
Brook, Mary Isabel.....	Piano	Judith Gap
Budd, Elva.....	Piano	Bozeman
Buzard, Leonora Lila.....	Piano	Bozeman
Buzard, Marion Frances.....	Piano	Bozeman
Carmichael, Mabel Esther.....	Voice	Butte
Chesley, Rose Mildred.....	Piano	Hobson
Cleland, Vera Ernestine.....	Piano	Hardin
Cobleigh, Winifred.....	Piano	Bozeman
Combs, Dora.....	Piano	Bozeman
Cooley, Elizabeth Content.....	Voice	Bozeman
Cooley, George.....	Voice	Bozeman
Davis, Wilbur B.....	Piano	Bozeman
Edwards, Mrs. M. J.....	Voice	Bozeman
Esgar, Rea.....	Piano	Bozeman
Everett, Maryfrances.....	Voice	Livingston
Fabrick, Mrs. Dick.....	Piano	Bozeman
Greene, Gladys Leckliter.....	Voice	Salesville
Harris, Vera.....	Voice	Bozeman
Haynes, Etta.....	Piano	Clancy

Hereim, Elida Christine.....	Voice	Lennepe
Herriott, Evelena Ara.....	Piano.....	Thompson Falls
Higgins, Mae Crosby.....	Piano	Bozeman
Holden, Zaydah.....	Piano	Belgrade
Hollier, Myrtle.....	Piano	Bozeman
Hollier, Trena.....	Voice	Bozeman
Ingram, Doris.....	Piano	Helena
Jacob, Sadie Thomas.....	Piano	Helena
Jones, Marguerite.....	Voice	Bozeman
Knott, Georgia Frances.....	Voice	Heron
Lappe, Evelyn L.....	Voice	Bozeman
Lease, Helen Elizabeth.....	Piano.....	Great Falls
Leckliter, Manila B.....	Voice	Bozeman
Lewis, Helen.....	Piano	Howard
Linfield, Leila Mary.....	Piano	Bozeman
Linfield, Azalea.....	Piano	Bozeman
Lippert, Ruby Elizabeth.....	Voice	Townsend
McCracken, Lucille Virginia.....	Piano	Livingston
Marquis, Minnie Ellen.....	Voice	Bozeman
Menzel, Mrs. Tillie.....	Voice	Bozeman
Millegan, Mary Esther.....	Voice	Eureka
Minter, Roberta.....	Voice	Bozeman
Montgomery, Alva.....	Voice	Hardin
Nixon, Florence R.....	Piano	Bozeman
Peterson, Millard.....	Piano	Culbertson
Primmer, Blonda A.....	Piano	Bozeman
Ribble, Bel.....	Voice	Bozeman
Roberts, Jennie.....	Piano	Bozeman
Roosevelt, Mrs. G. C.....	Voice	Bozeman
Sackett, Nona Elzina.....	Piano	Billings
Snyder, Bess Irene.....	Piano.....	Clarion, Pa.
Steeple, Hilda.....	Piano	Froid
Story, Virginia.....	Piano	Bozeman
Switzer, Florence.....	Voice	Bozeman
Taylor, Lucille.....	Piano	Bozeman
Todd, Verle Elizabeth.....	Piano	Bozeman
Wilton, June Erma.....	Piano	Bozeman
Young, Ethel Ellen.....	Piano	Bozeman

SUMMER QUARTER STUDENTS

Accola, Grace.....	Bozeman
Alexander, Violet.....	Medicine Lake
Anderson, Alma.....	Helena
Anderson, Josephine.....	Tampico
Anderson, Pearl.....	Philipsburg
Antonsen, Bessie.....	Bozeman

Asselin, Pearl.....	Terry
Baker, Blanche.....	Helena
Bannister, Margaret.....	Meredith
Barclay, Marguerite C.....	Bozeman
Bellivou, Virginia M.....	Philipsburg
Bergen, Mrs. L. C.....	Bozeman
Bevier, Helen Adine.....	Logan
Bigelow, Irma.....	Bozeman
Blake, Gertrude.....	Billings
Bohart, Ruby E.....	Wilsall
Bole, Elizabeth.....	Bozeman
Bole, Margaret.....	Bozeman
Bosworth, Hilda.....	Swan Lake
Brainard, Bessie.....	Reed Point
Bridston, Deborah.....	Valier
Broadbent, Estella D.....	Hysham
Brown, Hazel A.....	Clyde Park
Buhler, Justina.....	Polson
Burley, Miriam.....	Conrad
Byers, Anna M.....	Manhattan
Cain, Gladys A.....	Livingston
Callaghan, Beatrice.....	Sac City, Iowa
Carroll, Mary Edna.....	Hysham
Cass, Jennie.....	Angela
Cassiday, Nora M.....	Eden Valley, Minn.
Clarke, Ruth M.....	Roundup
Clary, Ruth V.....	Bozeman
Cleghorn, Ina.....	Bozeman
Clopton, Myrtis C.....	Bozeman
Collette, Mrs. Bessie.....	Westmore
Condon, Bessie.....	Livingston
Cooper, Verneice.....	Willow Creek
Corcoran, Helen M.....	Conrad
Cowan, Helen.....	Chadbourn
Creighton, Audrey.....	Devon
Cummings, Etta E.....	Troy
Davidson, Maryellen.....	Bozeman
Davis, Mamie A.....	Bozeman
Dowd, Laura.....	Sykes
Dunham, Alfa B.....	Olive
Ellis, Albert J.....	Medicine Lake
Ellis, Louella.....	Great Falls
Enseleit, Lydia.....	Hinsdale
Everett, Florence M.....	Wallace, Idaho
Faille, Mildred B.....	Medicine Lake
Falconer, Ellen Jane.....	Waterloo
Fink, Nora Nellie.....	Baker
Finkenbiner, Elsie E.....	Conrad

Fisher, Mary.....	Kalispell
Fisher, Ray E.....	Bozeman
Foix, Mayme D.....	Devon
Ford, Edith.....	Bozeman
Fowler, Bess.....	Bozeman
Friederichs, Ruth.....	Helena
Friend, Gladys.....	Eureka
Gaghagen, Nettie S.....	Conrad
Giffin, Mildred.....	Helena
Gill, Ellen.....	Bozeman
Gracey, Ella.....	Bozeman
Gray, Florence.....	Bozeman
Hall, Agnes Catherine.....	Helena
Harley, Florence.....	Sixteen
Farris, Cornelia.....	Castle Buttes
Harris, Elizabeth.....	Alzada
Hart, Josie R.....	Livingston
Hartman, June.....	Bozeman
Hazelton, Cecilia.....	Townsend
Hereim, Elida C.....	Lennepe
Hess, Barbara.....	Devon
Higgins, Roxie.....	East Helena
Hinds, Verna.....	Miles City
Hofman, Mildred Lillian.....	Reed Point
Hopwood, Ada.....	Hinsdale
Houston, E. Lina.....	Bozeman
Houx, Ruby Francis.....	Acton
Hoyt, Mary P.....	Rexford
Hundley, Clara M.....	Boulder
Immel, Anna.....	Helena
Johnson, Bertha.....	Bozeman
Johnson, Mrs. Sadie.....	Bozeman
Jones, Mary A.....	Bozeman
Jones, Marguerite E.....	Bole
Judd, Irene R.....	Bozeman
Kellams, Pearl.....	Medicine Lake
Kenney, Frances.....	Bozeman
Klammer, Myrtle Emily.....	Worden
Klebe, Elizabeth M.....	Belgrade
Kleinschmidt, Alice M.....	Bozeman
Kobelin, Adah F.....	Broadview
Kountz, Ida.....	Bozeman
Laidlaw, Byron E.....	Butte
Lane, Isabel.....	Three Forks
Larson, Bertina.....	Libby
Larson, Doris Mildred.....	Bozeman
Leckliter, Manila.....	Salesville
Lee, Beatrice.....	Eureka

Lee, Helen.....	Eureka
Lehner, Annie M.....	Nye
Lehr, Bea.....	Columbus
Lines, Fern.....	Kalispell
Lingshire, Margaret Winifred.....	Helena
Love, Inez E.....	Riceville
Lowry, Hazel.....	Livingston
Lyons, Addie.....	Pray
MacDonald, Lina M.....	Livingston
McDonnell, Rose.....	Logan
McGrade, Isabel.....	Libby
McVicker, Grace.....	Bozeman
Marks, Nora L.....	Mildred
Maryott, Vera E.....	Salesville
Meenwenberg, James.....	Shepherd
Menth, Mamie E.....	Lennepe
Mercier, Ruth.....	Livingston
Moore, Inez.....	Bozeman
Morgan, Nan J.....	Bozeman
Mulcahy, Kate Birmingham.....	Great Falls
Munyan, Daisy.....	Shepherd
Murphy, Berneice Patricia.....	Ballantine
Murray, Margaret.....	Boyes
Neal, Myda.....	Livingston
Nelson, Alice.....	Bozeman
Noah, Margaret.....	Bozeman
Noble, Florence.....	Billings
Omta, Anna.....	Bozeman
Omta, Grace.....	Bozeman
Orvis, Elizabeth.....	Salesville
Patten, Eleanor F.....	Bozeman
Peterson, Cleo.....	Bozeman
Plummer, Irene V.....	Plummerton
Preus, Caroline M.....	Kingsley
Preus, Valesca.....	Kingsley
Randall, Cordelia M.....	Belgrade
Raymond, Arthur J.....	Havre
Reich, Bertha E.....	Garland
Reynolds, Hazel.....	Rollins
Rice, Bertha.....	Sayre
Robinson, Annie.....	Billings
Rosenberg, Mary.....	Bozeman
Rosenthal, Elizabeth.....	Stewart, Nev.
Sauers, Mrs. H. H.....	Geraldine
Sauers, H. H.....	Geraldine
Sayers, Lela.....	Bozeman
Schreibeis, Charles D.....	Ft. Washakie, Wyo.
Scull, Beulah.....	Manhattan

Seavy, Merle.....	Billings
Serles, Lucille F.....	Kalispell
Shellenberger, Harriet.....	Bozeman
Sherwood, Faith.....	Libby
Skank, Gladys.....	Bozeman
Slater, Alta.....	Three Forks
Slater, Helen Marie.....	Three Forks
Smith, Marie.....	Boulder
Smith, Mrs. Edward.....	Bozeman
Smith, Ethol E.....	Bloomfield
Sodergren, Marjorie.....	Baker
Steadman, Martha M.....	Loesch
Steadman, Carrie M.....	Loesch
Stephenson, Ella May.....	Belgrade
Stevens, Bessie V.....	Bozeman
Stewart, Marie.....	Lavina
Stone, Nell.....	Hartford, Wis.
Stone, Helen.....	Hartford, Wis.
Story, Byron F.....	Bozeman
Story, Katherine.....	Bozeman
Stockburger, Lois.....	Rapelje
Street, Grace Leona.....	Bozeman
Sutton, Virginia.....	Polson
Swanson, Ruby F.....	Troy
Tate, Louella.....	Custer
Taylor, Cora M.....	Missoula
Teeple, Georgia I.....	Harlem
Thompson, Jeanette.....	Anaconda
Tillopson, Clara.....	Virginia City
Triol, Ella Addie.....	Columbus
Troeltzsch, Elsa.....	Helena
Vale, Gertrude.....	Glendive
Vanderbeck, Anna.....	Virginia City
Vold, Nettie.....	Three Forks
Vreeland, Dorothy.....	Bozeman
Webster, Jesse.....	Chadbourne
Wheat, Laura.....	Columbus
Whisnant, B. E.....	Hardin
Wilke, Maude F.....	Kalispell
Williams, Harriet.....	Dunkirk
Williams, Margaret E.....	Baker
Willis, Esther.....	Farmington
Wilson, Mrs. M. R.....	Bozeman
Wilson, Maude Parker.....	Bozeman
Woodruff, Mrs. LaFayette.....	Bozeman
Yearns, Anna Edna.....	Hesper
Yeatts, Roy.....	Beaverton
Young, Margaret Elizabeth.....	Three Forks

STUDENTS ARMY TRAINING CORPS

Section A

Alquist, Merrill J.....	Engineering	Conrad
Anderson, Roy C.....	Officer of the Line.....	Belt
Astle, Thomas, Jr.....	Officer of the Line.....	Livingston
Athey, Walter W.....	Engineering.....	Great Falls
Bachman, Lester E.....	Engineering	Grantsdale
Bell, Fred W.....	Agriculture	Butte
Bell, John D.....	Engineering	Belgrade
Belshaw, George E.....	Chemistry	Bozeman
Bentall, Frank Maurice.....	Engineering	Hathaway
Bogy, Tom Vital.....	Engineering	Chinook
Bolles, Henry Jason.....	Chemistry	Teigen
Bondurant, Charles B.....	Officer of the Line.....	Kalispell
Bondy, Frank E.....	Officer of the Line.....	Great Falls
Bonn, Fred Louis.....	Engineering	Bozeman
Bowen, David R.....	Officer of the Line.....	Worden
Bowen, Lowell R.....	Engineering	Butte
Bradley, John.....	Officer of the Line.....	Butte
Bright, Kenneth A.....	Engineering	Terry
Bruce, Norman C.....	Officer of the Line.....	Canton
Bryant, George A.....	Agriculture	Waterloo
Burley, George A.....	Officer of the Line.....	Park City
Bush, Elmer Joseph.....	Officer of the Line.....	Pony
Butler, Chester L.....	Officer of the Line.....	Hobson
Calone, John J.....	Officer of the Line.....	Belt
Cameron, Fred Herbert.....	Officer of the Line.....	Terry
Carlson, Oscar Merlin.....	Officer of the Line.....	Helena
Carroll, Charles Patrick.....	Engineering	Dillon
Catron, Roy I.....	Engineering	Bozeman
Chambers, Roy O.....	Officer of the Line.....	Ingomar
Cheney, Clark T.....	Agriculture.....	Twin Bridges
Chestnut, Ben Howard.....	Engineering	Anaconda
Christman, Bruce John.....	Officer of the Line.....	Dillon
Clark, Leon Waldo.....	Officer of the Line.....	Mildred
Columbus, Walter Frank.....	Officer of the Line.....	Red Lodge
Comer, Cloyde E.....	Officer of the Line.....	Medicine Lake
Conklin, Melvin.....	Chemistry	Nina
Cottingham, Edward Basil.....	Officer of the Line.....	Helena
Courtney, Robert Dewey.....	Officer of the Line.....	Harrison
Coyan, Paul H.....	Officer of the Line.....	Livingston
Creed, Charles Ishamael.....	Officer of the Line.....	Joliet
Dawes, Robert Earl.....	Officer of the Line.....	Bozeman
Degenhart, Frank H.....	Officer of the Line.....	Philipsburg
Davidson, Paul.....	Industrial Chemistry.....	Bozeman
DeVore, Lloyd G.....	Agriculture	Been
Donohoe, Carrol Paul.....	Officer of the Line.....	Whitehall

Donohue, Frank M.	Officer of the Line	Dillon
Dougherty, James Joseph	Chemistry	Anaconda
Dyer, Glenn Wilbur	Officer of the Line	Moore
Dyer, Lloyd W.	Officer of the Line	Moore
Ecton, Zales N.	Officer of the Line	Manhattan
Ellingson, Henry J.	Engineering	Big Timber
Ellis, Harry Vernon	Engineering	Absarokee
Entorf, Edgar Donald	Pre-Medic	Cleveland
Erickson, Paul Reimel	Engineering	Hamilton
Falberg, Paul Malcolm	Officer of the Line	Billings
Fenner, Lawrence G.	Engineering	Dillon
Fenton, John Stanley	Officer of the Line	Hardin
Finlayson, Max Theobald	Officer of the Line	Livingston
Fitzgerald, James, Jr.	Engineering	Bozeman
Fleming, Jasper Emery	Officer of the Line	Forsyth
Flint, Lyle Howard	Officer of the Line	Terry
Flynn, Jesse Charles	Officer of the Line	Logan
Ford, Harold Ernest	Officer of the Line	Butte
Fox, Glenn A.	Chemistry	Livingston
Galt, Rollin Donald	Engineering	Stanford
Gard, David Lee	Chemistry	Belfry
Gauen, Joseph Kenneth	Officer of the Line	Custer
Gilbert, Leslie Sylvester	Engineering	Perma
Grant, Paul Ambrose	Engineering	Columbus
Gregg, James Royal	Officer of the Line	Billings
Guthrie, Vinton Lewis	Officer of the Line	Reed Point
Hagen, Paul Joseph	Officer of the Line	Glendive
Harrington, Cornelius	Engineering	Butte
Hart, Glenn J.	Engineering	Harlowton
Haughawout, Chester Frank	Officer of the Line	Miles City
Hauseman, Dean	Officer of the Line	Virginia City
Hayes, Cornelius	Officer of the Line	Butte
Hecox, Lawrence Russell	Engineering	Belgrade
Hennessey, Thomas Edward	Officer of the Line	Circle
Henry, Forrest G.	Officer of the Line	Townsend
Hibbert, Norman W.	Officer of the Line	Chicago, Ill.
Hodgkiss, Grant H.	Engineering	Choteau
Honnold, Clark James	Officer of the Line	Joliet
Hope, Charles David	Officer of the Line	Hamilton
Hopkinson, Thomas George	Engineering	Choteau
Hough, Harold Hart	Engineering	Belgrade
Humphrey, Leo Chandler	Chemistry	Holyoke, Mass.
Huson, Robert Dewey	Agriculture	Libby
Ingham, William Cyrus	Officer of the Line	Miles City
Jackson, Clarence Everett	Engineering	Cameron
James, Fred Clark	Engineering	Wibaux
Jenks, Rolland Harry	Agriculture	Lewistown

Johns, Ernset Wayne	Chemistry	Wilsall
Johnson, Albert Jurgen	Officer of the Line	Hinsdale
Johnson, Arthur Emanuel	Pre-Medic	Fromberg
Johnson, Jacob Adam	Officer of the Line	Worden
Johnson, Lester James	Agriculture	Victor
Jones, Russell Bunnell	Agriculture	Cascade
Jorgenson, Arthur Roy	Officer of the Line	Wisdom
Joseph, Walter Edward	Officer of the Line	Bozeman
Kain, Ronald Stuart	Chemistry	Helena
Kane, Ellsworth	Officer of the Line	Conrad
Kapp, Emory Mills	Engineering	Livingston
Kenck, Ralph Edward	Officer of the Line	East Helena
Kennedy, Walter Allen	Engineering	Missoula
King, Joseph C.	Officer of the Line	Lewistown
Kohnen, John Holmes	Engineering	Great Falls
Kruger, Arnold Reinhardt	Officer of the Line	Plains
Ladic, Sanford William	Officer of the Line	Butte
Lebert, Frank	Officer of the Line	Glasgow
Lewis, Donald John	Officer of the Line	Hardin
Lewis, George Aldean	Officer of the Line	Roundup
Lipe, James G.	Officer of the Line	Acton
Little, Harold William	Officer of the Line	Hamilton
Lovely, Bryan Thomas	Agriculture	Clyde Park
Luther, Merrill Kenneth	Chemistry	Choteau
Lynch, Cornelius Joseph	Officer of the Line	Terry
Lyman, Perrin Fisk	Agriculture	Cascade
Lyons, Leonadus Ruskin	Chemistry	Livingston
Mabee, William Bruce	Officer of the Line	Glasgow
Mack, Robert Howard	Officer of the Line	Cardwell
Matthew, Emmet S.	Officer of the Line	Bozeman
McConnell, Grant B.	Engineering	Butte
McFadden, Sheldon Teed	Officer of the Line	St. Ignatius
McFarlin, George C.	Officer of the Line	Butte
McInnis, Daniel Robert	Officer of the Line	Raynesford
McNaul, William Roy	Engineering	Butte
McVey, Albert Vernon	Engineering	Lewistown
Meece, Millard	Officer of the Line	Manhattan
Millard, Raymond Alfred	Officer of the Line	Belt
Miller, Lyle Winston	Officer of the Line	Whitefish
Mink, Leon Delmont	Officer of the Line	Huntley
Miskimen, Jay Franklin	Officer of the Line	Glendive
Mitchell, Fergus Greening	Officer of the Line	Great Falls
Moen, Leonard Willard	Officer of the Line	Culbertson
Moriarity, James	Officer of the Line	Great Falls
Mortin, Clarence August	Engineering	Bozeman
Nelson, Daniel Emil	Officer of the Line	Billings
Norris, Earl R.	Chemistry	Helena

Norton, Henry Burns.....	Officer of the Line.....	East Helena
Norton, Ralph Alexander.....	Officer of the Line.....	East Helena
Oberle, Nicholas.....	Engineering	Bozeman
Parrish, William Augustus.....	Engineering.....	Big Timber
Patterson, Elmer Pickens.....	Officer of the Line.....	Ada, Oklahoma
Pelo, Carl John.....	Officer of the Line.....	Red Lodge
Peterson, Alton.....	Officer of the Line.....	Culbertson
Pietsch, Lloyd Charles.....	Pre-Medic	Bozeman
Pickens, Russell Marion.....	Officer of the Line.....	Huntley
Pinckney, Alvin J.....	Chemistry	Bozeman
Pollard, Rolla Estus.....	Chemistry	Craig
Potter, Earl Francis.....	Officer of the Line.....	Bozeman
Pouder, Oliver H.....	Engineering	Billings
Poulsen, Edward Boris.....	Engineering	Laurel
Price, Merwin Jay.....	Officer of the Line.....	Ballantine
Redfield, Robert Edward.....	Officer of the Line.....	Manhattan
Richards, Albert.....	Officer of the Line.....	Gibson
Romek, William Anthony.....	Engineering	Bridger
Rose, Millard A.....	Chemistry	Bozeman
Rothwell, Craig S.....	Engineering	Columbus
Rud, Fritz Egon.....	Officer of the Line.....	Claire City, S. D.
Ruen, Philip R.....	Officer of the Line.....	Sand Point, Idaho
Ryan, Clement James.....	Engineering	Melstone
Ryno, Darrell Richard.....	Officer of the Line.....	Butte
Saldine, Emil John.....	Officer of the Line.....	Great Falls
Sands, Gordon Clack.....	Officer of the Line.....	Have
Schekenbach, Frank William.....	Engineering	Butte
Schmitz, Walter Stephen.....	Chemistry	Anaconda
Schneider, August M.....	Officer of the Line.....	Helena
Schrupp, Harold.....	Officer of the Line.....	Shepherd
Sert, Alexander.....	Officer of the Line.....	Worden
Scott, Samuel.....	Chemistry	Butte
Scott, Willard Jay.....	Officer of the Line.....	Hardin
Shoebottom, Thomas Bruce.....	Officer of the Line.....	Huntley
Shuyler, Ernest Donald.....	Officer of the Line.....	Ringling
Summers, James Edward.....	Officer of the Line.....	Billings
Sutherland, Sidney Samson.....	Officer of the Line.....	Polson
Smith, Merle Edward.....	Officer of the Line.....	Billings
Sprouse, Don Carol.....	Engineering	Terry
Steel, Fred Kippen.....	Officer of the Line.....	Great Falls
Steele, Dewey Hobson.....	Officer of the Line.....	Choteau
Sterrett, Harry Garfield.....	Officer of the Line.....	Townsend
Street, Joseph Dewey.....	Officer of the Line.....	Bozeman
Sundberg, Clarence August.....	Officer of the Line.....	Butte
Swan, Edward.....	Chemistry	Butte
Symes, Avarad Fearson.....	Officer of the Line.....	Belt
Thomas, Clarence Lee.....	Officer of the Line.....	Butte

Tobey, Marshall LeRoy.....	Officer of the Line.....	Highwood
Tobey, Willard.....	Officer of the Line.....	Highwood
Todd, Harold Wesley.....	Officer of the Line.....	Bozeman
Wagner, Rush Faville.....	Officer of the Line.....	Roundup
Ware, Frank Edward.....	Officer of the Line.....	Calabar
Walters, George.....	Engineering	Helena
Webb, Frank Daniel.....	Engineering.....	Judith Gap
Weber, Bryan.....	Officer of the Line.....	Helena
Wildman, Herbert.....	Officer of the Line.....	Knowlton
Wiles, Glenn D.....	Officer of the Line.....	Columbia Falls
Willard, Harrison Eugene.....	Engineering	Roundup
Wilson, Donald Alfred.....	Officer of the Line.....	Forsyth
Wise, Harold Pau.....	Officer of the Line.....	Great Falls
Wood, George Walter.....	Officer of the Line.....	Bozeman
Woodard, Marvin Ingram.....	Officer of the Line.....	Whitehall
Wylie, Paul.....	Engineering	Bozeman
Young, Thomas Richardson.....	Officer of the Line.....	Great Falls

STUDENTS ARMY TRAINING CORPS

Section B

Acton, Bernard.....	Automobile Mechanics.....	Roundup
Baxter, Earl H.....	Forge Work.....	Lewistown
Barrows, Thomas E.....	Agriculture.....	Fort Benton
Beck, James.....	Radio Telegraphy.....	Buffalo
Berry, Merle.....	Engine Mechanics.....	Anaconda
Bliss, Frank.....	Engine Mechanics.....	Anaconda
Bodding, Alfred.....	Automobile Mechanics.....	Eureka
Boecher, Lee.....	Automobile Mechanics.....	Mizpah
Bohart, Herschall.....	Forge Work.....	Bozeman
Bovee, William.....	Automobile Mechanics.....	Polson
Brady, William.....	Engine Mechanics.....	Great Falls
Brooks, Herbert.....	Automobile Mechanics.....	Helena
Buckingham, William.....	Automobile Mechanics.....	Lavina
Buergard, Louis.....	Engine Mechanics.....	Camas
Burgess, James.....	Radio Telegraphy.....	Harlem
Chesek, Eric.....	Automobile Mechanics.....	DeGrand
Connar, William.....	Automobile Mechanics.....	Bridger
Dehnert, Francis.....	Radio Telegraphy.....	Fort Benton
Derby, Robert.....	Automobile Mechanics.....	Missoula
Deskin, James.....	Mechanic Arts.....	Bozeman
Dolin, Chester.....	Engine Mechanics.....	Baker
Donath, Charles.....	Automobile Mechanics.....	Helena
Ebel, Henry.....	Engine Mechanics.....	Park City

Echo, Blaze	Automobile Mechanics	Wyola
Edwards, Ralph	Automobile Mechanics	Joplin
Ely, Robert	Auto Mechanics	Kennewick, Wash.
Elzea, Joseph	Automobile Mechanics	Miles City
Emerson, Elmer	Automobile Mechanics	Miles City
Featherly, Fred	Engine Mechanics	Dillon
Featherly, Lambert	Automobile Mechanics	Butte
Fine, William	Automobile Mechanics	Kalispell
Frick, Jerry	Automobile Mechanics	Ural
Gilbert, John	Forge Work	Deer Lodge
Ginther, George	Automobile Mechanics	Glasgow
Goering, Grover	Engine Mechanics	White Sulphur Spr.
Goucher, Verne	Automobile Mechanics	Billings
Grabow, William	Automobile Mechanics	Livingston
Graham, George	Automobile Mechanics	Poplar
Grosfield, Edwin	Engine Mechanics	Big Timber
Grossman, George	Automobile Mechanics	Helena
Guth, Frank	Radio Telegraphy	Sleepy Eye, Minn.
Hansen, Walter	Radio Telegraphy	Harlowton
Harper, Paul	Radio Telegraphy	Wolf Point
Hedges, Fred	Radio Telegraphy	Grass Range
Hey, Ernest	Automobile Mechanics	Miles City
Hobensack, Horace	Engine Mechanics	Lewistown
Hughes, Thomas	Automobile Mechanics	Hall
Imholte, Urban	Automobile Mechanics	Hardin
Johnson, Daniel	Automobile Mechanics	Shelby
Johnston, George	Automobile Mechanics	Alzada
Joubert, Ezra	Forge Work	Medora, N. D.
Kirchner, Eugene	Radio Telegraphy	Circle
Labrie, Joseph	Automobile Mechanics	Harlowton
Lair, Emil	Automobile Mechanics	Malta
Lamkin, Benjamin	Automobile Mechanics	Meridan, Ida.
Lester, George	Automobile Mechanics	Missoula
Liles, Vernon	Automobile Mechanics	Union
Links, Alvin	Forge Work	Terry
Listernd, Morris	Radio Telegraphy	Wolf Point
Lowery, Thomas	Automobile Mechanics	Basin
MacCallum, Gerald	Mechanic Arts	Anaconda
Mann, John	Radio Telegraphy	Chewelah, Wash.
Mahoney, Cornelius	Engine Mechanics	Canton
McCarthy, Vincent	Engine Mechanics	Canton
Mead, Maynard	Mechanic Arts	Freewater
Meek, Randy	Automobile Mechanics	Wibaux
Mendenhall, Dean	Forge Work	Absarokee
Miller, William	Forge Work	Glasgow
Montgomery, Jay	Radio Telegraphy	Chinook
Moore, Charles	Automobile Mechanics	Kalispell

Murphy, Edward.....	Engine Mechanics.....	Great Falls
Murray, George.....	Radio Telegraphy.....	Hamilton
Neuman, Ernest.....	Agriculture	Heron
Nolte, Edward.....	Forge Work.....	Silver Star
O'Leary, Arthur.....	Engine Mechanics.....	Butte
Outzen, Arthur.....	Automobile Mechanics.....	Sydney
Paulson, Richard.....	Engine Mechanics.....	Butte
Peaseley, Thomas.....	Automobile Mechanics.....	Helena
Perrin, Tolbert.....	Radio Telegraphy.....	Forsyth
Phillips, Wayne.....	Forge Work.....	Deer Lodge
Pound, Rupert.....	Radio Telegraphy.....	Gardiner
Range, James.....	Automobile Mechanics.....	Butte
Reypens, Ludovic.....	Forge Work.....	Butte
Rolfe, Alexander.....	Forge Work.....	Foxhome, Minn.
Rooney, Paul.....	Automobile Mechanics.....	Butte
Rowe, Forest.....	Radio Telegraphy.....	Pasadena, Cal.
Sadler, Robert.....	Automobile Mechanics.....	Cascade
Sandberg, Harold.....	Forge Work.....	Collins
See, John.....	Mechanic Arts.....	Mondak
Sholtz, William.....	Engine Mechanics.....	Hall
Smith, Harland.....	Radio Telegraphy.....	Saco
Smith, John.....	Automobile Mechanics.....	Boulder
Sodergren, Neil.....	Forge Work.....	Baker
Stenberg, Toston.....	Engine Mechanics.....	Big Timber
Stevens, Edward.....	Automobile Mechanics.....	Forsyth
Stratton, Larcy.....	Engine Mechanics.....	Stevensville
Sutton, Lloyd.....	Automobile Mechanics.....	Bloomfield
Tintinger, Lester.....	Forge Work.....	Cascade
Torgerson, Theron.....	Automobile Mechanics.....	Ethridge
Trippit, Raoul.....	Forge Work.....	Billings
Verge, Cecil.....	Automobile Mechanics.....	Havre
Verrall, Claude.....	Automobile Mechanics.....	Conrad
Vincent, Alan.....	Automobile Mechanics.....	McAllister
Whittaker, Dewey.....	Mechanic Arts.....	Great Falls
Wicke, George.....	Engine Mechanics.....	Anaconda
Wilson, Damon.....	Engine Mechanics.....	Benchland
Wilson, Harmon.....	Automobile Mechanics.....	Bozeman

Summary of Registration.

	1917-18			1918-19		
	Men	Women	Total	Men	Women	Total
College of Agriculture	59	0	59	38	0	38
College of Engineering	95	3	98	77	0	77
College of Applied Science	26	17	43	36	17	53
College of Household and Industrial Arts	20	140	160	18	141	159
Vocational Education	11	0	11	3	0	3
School of Home Economics	0	22	22	0	13	13
School of Mechanic Arts	65	0	65	60	0	60
School of Agriculture	89	0	89	37	0	37
School of Music	27	90	117	4	58	62
Total	392	272	664	274	228	502
Summer Quarter	0	176	176	8	189	197
Ministers' Week	38	0	38	0	0	0
Farmers' Week	166	112	278	0	0	0
Total	596	560	1156	282	417	699
Students' Army Training Corps, Section "A"	0	0	0	203	0	203
Students' Army Training Corps, Section "B"	0	0	0	107	0	107
Total	596	560	1156	592	417	1009
Counted Twice	10	41	51	80	42	120
Grand Total	586	519	1105	512	375	887

SUMMARY BY COUNTIES AND STATES

Beaverhead County.....	11
Big Horn County.....	14
Blaine County.....	6
Broadwater County.....	13
Carbon County.....	13
Carter County.....	5
Cascade County.....	48
Choteau County.....	16
Custer County.....	17
Dawson County.....	8
Deer Lodge County.....	17
Fallon County.....	6
Fergus County.....	28
Flathead County.....	24
*Gallatin County.....	216
Granite County.....	8
Hill County.....	12
Jefferson County.....	13
Lewis and Clark County.....	43
Lincoln County.....	12
Madison County.....	18
Meagher County.....	9
Missoula County.....	10
Musselshell County.....	9
Mineral County.....	2
Park County.....	34
Phillips County.....	6
Powell County.....	6
Prairie County.....	16
Ravalli County.....	9
Richland County.....	3
Rosebud County.....	12
Sanders County.....	5
Sheridan County.....	12
Silver Bow County.....	41
Stillwater County.....	15
Sweet Grass County.....	10
Teton County.....	23
Toole County.....	5
Valley County.....	14
Wheatland County.....	10
Wibaux County.....	4
Yellowstone County.....	48
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Total Montana.....	851
Other States.....	36
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Grand Total.....	887

*Note—The 216 students from Gallatin County were enrolled in the College as follows:

College Courses.....	101
Secondary Courses.....	19
School of Music.....	17
Summer Session.....	65
Students' Army Training Corps	
Section "A".....	12
Section "B".....	2
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	216

Alumni.

With Their Years, Degrees and Present Addresses and Occupations.

- Abell, Tracy H., B. S., 1915; Instructor in Horticulture, Utah Agricultural College, Logan, Utah.
- Abrahamson, Irene, B. S., 1918; Instructor in Domestic Science, Fromberg High School, Fromberg, Montana.
- Alderson, Myrtle, B. S., 1913; Mrs. J. H. Griswold, Deer Lodge, Montana.
- Allen, Elbert, B. S., 1903; Attorney, Livingston, Montana.
- Allen, Mollie, B. S., 1916; Instructor in Domestic Science, Butte High School, Butte, Montana.
- Alward, Mary L., B. S., 1908; W. M. C. A. Work, 12 Rue d' Aguesseau, Paris, France.
- Annin, James T., B. S., 1911; Owner Columbus News, Columbus, Montana.
- Arneson, Harriet, B. S., 1918; Bank Clerk, Big Timber, Montana.
- Babbitt, Minnie, B. S., 1918; Instructor in Domestic Science, Raynesford, Montana.
- Baker, Florence, B. S., 1912; Deceased.
- Baker, Harold E., B. E. E., 1907; Supt. Electric Power Company, Naches, Washington.
- Bancroft, Raymond E., B. S., 1911; Horticultural Inspector, Billings, Montana.
- Barnard, Robert B., B. S., 1910; C. M. & P. S. R. R., Electrification Department, Seattle, Washington.
- Batch, Otto, B. S., 1916; Homesteader, Mitchell, Montana.
- Bell, James C., B. S., 1911; Graduate Student Oregon Agricultural College, Corvallis, Oregon.
- Beerstecher, Ada, B. S., 1917; Graduate Student, John Hopkins University, Baltimore, Maryland.
- Benton, Ralph B., B. S., 1906; U. S. Bureau of Biological Survey, Los Angeles, California.
- Blankenship, E. V., B. S., 1897; Real Estate, Bozeman, Montana.
- Blessing, John, B. S., 1912; Farmer, Lewistown, Montana.
- Bole, Margaret, B. S., 1913; Printer, Bozeman Daily Chronicle Office, Bozeman, Montana.
- Bole, William S., B. S., 1906; Physician and Surgeon, Bozeman, Montana.
- Booker, Clinton T., B. S., 1911; Supt. Great Falls and Missouri River Sub-stations, Montana Power Company, Great Falls, Montana.
- Border, Blanche, B. S., 1918; Instructor in Home Economics, Dawson County High School, Glendive, Montana.
- Border, Ernest, B. S., 1916; Instructor in Agriculture, Gallatin County High School, Bozeman, Montana.
- Borthwick, Alberta, B. S., 1916; Home Demonstration Agent, Great Falls, Montana.

- Brabrook, Ralph, B. S., 1913; Directing Department, American Bridge Company, Chicago, Illinois.
- Breneman, Annie T., B. S., 1907; Instructor in Mathematics and Physics, Montana State College, Bozeman, Montana.
- Brewer, Lucille, B. S., 1909; Assistant Professor of Home Economics, Cornell University, Ithaca, New York.
- Brook, Thomas B., B. S., 1913; Working in Garage, Twin Bridges, Mont.
- Brooks, Roland, B. S., 1915; Farm Loan Representative, The Banking Corporation of Helena, Choteau, Montana.
- Crown, Archie S., B. S., 1910; Military Service, Electric Expert, U. S. Navy, Mare Island Navy Yards, San Francisco, Calif.
- Brown, Edith E., B. S., 1904; Mrs. John Milloy, Regina, Sask, Canada.
- Brown, Mary Holland, Housekeeper, Bozeman, Montana.
- Buckley, Thomas W., B. S., 1914; Civil Engineer, Manhattan, Montana.
- Bull, Edna, B. S., 1909; Mrs. G. W. Kirscher, Townsend, Montana.
- Bull, Frieda M., B. S., 1907; M. S., 1909; Instructor of Mathematics Montana State College, Bozeman, Montana.
- Bullock, Fred, B. S., 1917; Assistant Grain Standardization Bureau, Minneapolis, Minn.
- Bunnell, Ercell, B. S., 1918; Mechanical Testing Engineer, Elgin Motor Works, Argo, Ill.
- Burke, Edmund, B. S., 1907; Chemist and Meteorologist, Montana Agricultural Experiment Station, Bozeman, Montana.
- Burket, Alonzo D., B. S., 1915; Chemist, Three Forks Portland Cement Company, Trident, Montana.
- Butter, Donald, B. S., 1909; Electrical Engineer, General Electric Company, Schenectady, N. Y.
- Caldwell, Thomas O., B. A. C., 1899; Farmer, Lewistown, Montana.
- Cannon, Raymond E., B. S., 1917; Farm Labor Specialist, U. S. Dept. of Agriculture, Washington, D. C.
- Carmichael, Effie, B. S., 1910; Mrs. Vergil A., Spicer, Red Oak, Iowa.
- Carr, Irene H., B. S., 1911; Mrs. Claude Meserve, North Brighton, Me.
- Carr, M. L., B. S., 1917; Military Service, 1st Lieutenant, U. S. R., 166 Depot Brigade, Camp Lewis, American Lake, Washington.
- Chaffee, Sarah, B. S., 1906; Mrs. Rudolph Beseke, Oakesdale, Wash.
- Chestnut, Lula, B. S., 1916; Instructor in Home Economics, Wells High School, Wells, Nevada.
- Clark, Ben A., B. S., 1911; Farmer, Springdale, Montana.
- Clark, Grace, B. S., 1911; Missionary Old Umtali, Rhodesia, Africa.
- Clark, Olive, B. S., 1913; Dietitian, Fort Sheridan, Ill.
- Clarkson, Robert, B. S., 1917; County Agent, Choteau, Montana.
- Cockrel, Irvin, B. S., 1900; Osteopath Physician, New York City.
- Coffey, Hazel C., B. S., 1915; Graduate Student, Northwestern University, Evanston, Illinois.
- Cole, E. Lester, B. S., 1917; Military Service, 2nd Lieutenant, Sanitary Corps, A. E. F. France.

- Ccollins, Walter E., B. S., 1902; Attorney and Trust Officer, Daly Bank and Trust Company, Butte, Montana.
- Cock, Charles W., B. S., 1917; Board of Fire Underwriters, Butte, Mont.
- Cook, Donald H., B. S., 1917; Instructor in Chemistry, New Mexico Agricultural College, State College, New Mexico.
- Cook, George, B. S., 1912; Farmer and Stockman, Bozeman, Montana.
- Cooke, Amy, B. S., 1908; Mrs. Geo. Ambrose, Mackey, Idaho.
- Ccoley, Esther Belle, B. S., 1916; Instructor in Home Economics, State Normal School, Winona, Minnesota.
- Cotner, Victor, B. S., 1916; Civil Engineer, Lovell, Wyoming.
- Cowan, Lewis, B. C. E., 1904; Civil Engineer, Milwaukee Ry., Bozeman, Montana.
- Cullum, Georgia, B. S., 1914; Mrs. Geo. Roosevelt, Home Demonstration Agent, Gallatin County, Bozeman, Montana.
- Dahl, Hilmar, B. S., 1916; Military Service, Sheffield, Alabama.
- Daly, Freeman, B. S., 1912; County Surveyor, Choteau, Montana.
- Danielson, Mary, B. S., 1918; Medical Student, University of Minnesota, St. Paul, Minnesota.
- Davidson, Lyndall P., B. S., 1915; Chemist, Bozeman, Montana.
- Davidson, Mary E., B. S., 1910; Nurse Deaconess Hospital, Bozeman, Montana.
- Dawes, Rhoda, B. S., 1913; Mrs. Arthur Seamans, Huntley, Montana.
- DeCamp, Renan, B. S., 1917; Military Service, Signal Corps, Carnegie Institute, Pittsburg, Pa.
- DeMuth, David R., B. S., 1910; Deceased.
- DeMuth, Maude S., B. S., 1907; Mrs. W. D. Tallman, Bozeman, Montana.
- Donaldson, Noble C., B. S., 1912; Farmer, Glasgow, Montana.
- Douglas, Stanley, B. S., 1913; Montana Power Company, Norris, Mont.
- Draper, Charles H., B. S., 1912; Editor Carbon County Journal, Red Lodge, Montana.
- Driscoll, Wm. J., B. S., 1908; Civil Engineer, Lawrence, Mass.
- Drummond, Warren, B. S., 1918; Ensign, U. S. Navy, Paris, France.
- Duquette, Jay, B. S., 1917; Engineer, Montana Power Company, Hebgen Dam, Norris, Montana.
- Dusenbury, Inez, B. S., 1912; Teacher, Chester Schools, Chester, Mont.
- Eberle, Alfred M., B. S., 1915; Manager, Dan C. McKay Stock Ranch, Willard, Montana.
- Eckles, Mildred A., B. S., 1914; Instructor in Home Economics, Fort Benton, Montana.
- Edsall, William, B. S., 1911; Military Service, Junior Lieutenant, Ordinance, France.
- Edwards, Timothy, B. S., 1909; County Surveyor, Oro Fino, Idaho.
- Edwards, Margaret, B. S., 1912; Professor of Home Economics, Florida College for Women, Tallahassee, Florida.
- Ellis, Edward M., B. S., 1911; General Electric Co., Los Angeles, Calif.
- Emhoff, Elizabeth, B. S., 1918; Mrs. Lawrence Saltz, Anaconda, Mont.

- Everett, Inez, B. S., 1914; Mrs. Ed. Schimmele, Pine City, Minnesota.
- Fisher, Charles, M. B. S., 1908; Merchant, Bozeman, Montana.
- Fisher, Helen, B. S., 1910; Mrs. Fred Willson, Bozeman, Montana.
- Fiske, John M., B. S., 1915; General Electric Co., Lynn, Massachusetts.
- Flager, Harold J., B. E. E., 1907; Military Service, 2nd Lieutenant, Brest, France.
- Flager, Howard A., B. E. E., 1906; Military Service, Sergeant, Army of Occupation, Rainbow Division, Brughbohl, Germany.
- Flager, Ruth, B. S., 1910; Mrs. Carl Widener, Bozeman, Montana.
- Flaherty, Chas. D., B. C. E., 1904; County Surveyor, Jefferson County, Boulder, Montana.
- Flanders, Clara M., B. S., 1914; Mrs. William Vestal, Spokane, Wash.
- Fletcher, Elizabeth M., B. S., 1916; 241 North Euclid Ave., Pasadena, California.
- Flood, Marie, B. S., 1918; Mrs. Guy McCune, Victor, Montana.
- Ford, Arthur, B. S., 1916; Military Service, Washington, D. C.
- Foster, Florence, B. S., 1896; Mrs. Burton Flemming, Iowa City, Iowa.
- Fowler, Edith E., B. S., 1917; Instructor in Home Economics, Deer Lodge, Montana.
- Fowler, Viola, B. S., 1915; Stenographer, Bozeman, Montana.
- Fox, Hazel, B. S., 1910; Mrs. Bryam Mayfield, Enterprise, Oregon.
- Fox, Arthur P., B. S., 1917; Military Service, Co. 348 Field Artillery, American Lake, Wash.
- Freeman, Beatrice B., B. S., 1900; Mrs. Thomas Davis, Teacher, Absarokee, Montana.
- Freeman, William B., B. S., 1903; Consulting Engineer, Denver, Colo.
- Froebe, Frank J., B. S., 1911; Supt. Montana Power Company Ranches, Helena, Montana.
- Gardiner, Henry C., B. S., 1903; Veterinarian and Agriculturist, Anaconda Copper Mining Company, Anaconda, Montana.
- Garvin, John P., B. S., 1917; Electrical Engineer, Helena, Montana.
- Goodson, Anna, B. S., 1915; Mrs. Glenn Willson, Bozeman, Montana.
- Gordon, Fred E., B. S., 1913; Montana Farming Corporation, Agronomist, Hardin, Montana.
- Gottschalk, Carl, B. S., 1909; M. S., 1910; Instructor in Chemistry, No. Dak. Agricultural College, Fargo, N. D.
- Gray, Florence E., B. S., 1915; Instructor in Mathematics, Libby, Mont.
- Gray, Helen, B. S., 1918; Instructor in Home Economics, Valier, Mont.
- Gray, Wilson, B. S., 1915; Rancher, Choteau, Montana.
- Gray, John Wright, B. S., 1917; Instructor in Agriculture, High School, Belt, Montana.
- Griffith, Warren J., B. E. E., 1907; Chief Electrician Clemmer Theater, Spokane, Washington.
- Grimes, W. Walter, B. S., 1915; Military Service, 129 Aero Squadron, Kelly Field, South San Antonio, Texas.
- Hagerman, Edna, B. S., 1912; Mrs. P. A. Hiemlich, Great Falls, Montana.

- Haines, William T., B. S., 1911; Military Service, Instructor Radio Telegraphy Aviation Service, Cambridge, Mass.
- Hagen, Roy, B. S., 1918; General Electric Co., Pittsfield, Mass.
- Hall, Medra, B. S., 1918; Instructor in Home Economics, Manhattan, Montana.
- Haller, Beulah, B. S., 1918; Store Clerk, Butte, Montana.
- Ham, Frank W., B. S., 1903; M. S., 1905; Professor of Physics, Montana State College, Bozeman, Montana.
- Hamilton, Everett A., B. S., 1911; Supt. Madison River Power Company, Norris, Montana.
- Hansen, Charles L., B. S., 1914; Deceased.
- Hansen, Waldemar, B. S., 1917; State Food Laboratory, Bozeman, Mont.
- Harmen, Ella M., B. S., 1914; Home Demonstration Agent, Ravalli County, Hamilton, Montana.
- Hartman, Brooke, B. S., 1913; Banker, Lewistown, Montana.
- Hartman, June, B. S., 1910; Y. M. C. A. Work, France.
- Hartman, Lois K., B. S., 1907; Teacher of Spanish, High School, Elliott Hall, Tacoma, Washington.
- Hartman, Ruth, B. S., 1913; Mrs. Harley Hall, Butte, Montana.
- Hartman, Will, B. S., 1908; City Engineer, Livingston, Montana.
- Hawkins, P. H., M. S., 1903; Banker, Absarokee, Montana.
- Heageney, Wm. F., B. S., 1916; Field Agriculturist, Great Western Sugar Beet Co., Lovell, Wyoming.
- Heighton, Pearl A., B. S., 1914; Mrs. B. A. Roll, Choteau, Montana.
- Helstrom, Carl, B. S., 1918; Civil Engineer, Anaconda, Montana.
- Henderson, Charles F., B. S., 1910; Westinghouse Electric Company, Pittsburg, Pa.
- Henderson, Lisle, B. S., 1909; Montana Power Company, Butte, Montana.
- Higgins, Lucille, B. S., 1911; M. S., 1912; Mrs. S. W. Norton, Jr., Teacher, High School, Spokane, Washington.
- Hill, Lewis L., B. S., 1914; Military Service, Captain U. S. Army, Engineer Corps, A. E. F. France.
- Hind, Bert S., B. S., 1909; Supt. Montana Power Plant, Thompson Falls, Montana.
- Hinman, Ruth, B. S., 1912; Instructor in Detroit Public Schools, Detroit, Michigan.
- Hodgskiss, John E., B. S., 1912; M. S., 1913; Farmer, Choteau, Montana.
- Hodgskiss, Ursula, B. S., 1917; Deceased.
- Hodgskiss, William L., B. S., 1912; Ensign U. S. Navy, New York City.
- Hodgskiss, Ruby, B. S., 1918; Instructor in Home Economics, Butte, Montana.
- Hollier, Georgia, B. S., 1915; Mrs. Fred Benedict, Bremerton, Wash.
- Homann, Fred C., B. S., 1916; Instructor in Machine Work, Montana State College, Bozeman, Montana.
- Hutton, Fred, B. E. E., Deceased.
- Ingram, Craig, B. S., 1917; Ensign U. S. Navy, Stevens Institute, Hoboken, N. J.

- Jackson, Joel, B. S., 1917; Farmer, Harrison, Montana.
- Jacobs, Edward B., B. S., 1916; Military Service, 38th Company, 10 Bn., 166 Depot Brigade, Camp Lewis, Wash.
- Jacobs, Lillian, B. S., 1910; Mrs. Arie DeGroot, Three Forks, Montana.
- Jaeckel, Carl, B. S., 1917; U. S. Geological Survey, Raton, New Mexico.
- James, John S., B. S., 1909; Engineer, Montana Reservoir and Irrigation Company, Cascade, Montana.
- Jones, Kyle, B. S., 1912; American Expeditionary Forces, France.
- Jones, Ray S., B. S., 1915; Military Service, 1st Lieutenant U. S. Army,
- Jones, Wyatt Wagner, B. S., 1901; M. S., 1902; Plant Pathologist for American Smelting and Refining Company, Salt Lake City, Utah.
- Johnson, Martha, B. S., 1918; House Director, Hamilton Hall, M. S. C., Bozeman, Montana.
- Jorgenson, Ralph, B. S., 1917; Stockman, Wisdom, Montana.
- Kelley, Martin, B. S., 1916; Assistant City Engineer, Anaconda, Mont.
- Kelley, Jeanette, B. S., 1917; Home Demonstration Agent, Stillwater Co., Columbus, Montana.
- Kenck, Max W., B. S., 1914; Farmer, Silverbow, Montana.
- Kennard, Eveleen M., B. S., 1915; Mrs. Alfred Eberle, Willard, Montana.
- Kennedy, Cyril C., B. S., 1910; Deceased.
- Kiefer, James A., B. S., 1914; Instructor in Physics, Montana School of Mines, Butte, Montana.
- Kimpton, Addie, B. S., 1910; Mrs. Jas. H. Conrad, Wilsall, Montana.
- King, Lowell, B. S., 1904; Construction Engineer, Electric Railroad, Davenport, Iowa.
- King, Ruby E., B. S., 1909; Mrs. George Hogan, Musselshell, Montana.
- King, Willard V., B. S., 1910; Assistant Entomologist U. S. Bureau of Entomology, New Orleans, La.
- Kinney, Edward C., B. C. E., 1907; U. S. Reclamation Service, Dixon, Montana.
- Kinsella, Olive, B. S., 1916; Teacher of Home Economics, St. Catherine College, St. Paul, Minnesota.
- Kirk, Grace, B. S., 1911; Instructor in Home Science, Bozeman Public Schools, Bozeman, Montana.
- Kirk, Mary E., B. S., 1906; Deceased.
- Kirscher, W. Guy, B. S., 1909; Manager of Flour Mill, Townsend, Mont.
- Koch, Elers, B. S., 1901; Supervisor Forest Service, Missoula, Montana.
- Kountz, Josephine, B. S., 1918; Instructor in Home Economics, High School, Columbus, Montana.
- Kremer, William J., B. S., 1910; General Manager Pine View Irrigation Co., Ennis, Montana.
- Kretlow, Mary P., B. S., 1917; Teacher Home Economics, East Helena High School, East Helena, Montana.
- Kuhns, Myrtle, B. S., 1918; Instructor in Home Economics, Big Timber, Montana.
- Ladenburg, Carl, B. S., 1917; Electrical Engineer, Columbia Falls, Mont.

- Lamme, Maurice A., B. S., 1903; Director of Geology and Mineralogy, Government University, Montevideo, Uruguay, South America.
- Langohr, Don, B. S., 1917; Florist, Bozeman, Montana.
- Langohr, Louise, B. S., 1918; Clerk, Langohr's Greenhouses, Bozeman, Montana.
- Lannin, Earl A., B. S., 1912; Electrical Engineer, Montana Power Company, Lewistown, Montana.
- Leinard, Ford B., B. S., 1914; Farmer, Edwards, Montana.
- Lescher, Taylor, B. S., 1916; Military Service, Co. 1, 1st Training Bn., Sec. 1 Depot Brigade, 80th Div., Camp Lee, Va.
- Lessel, Erma, B. S., 1916; Chemist, Murray Hospital, Butte, Montana.
- Lewis, Edna, B. S., 1903; Berkeley, California.
- Linfield, Bertil, B. S., 1917; U. S. Geological Survey, Dept. of the Interior, Washington, D. C.
- Livingston, Walter, B. S., 1910; Assistant Engineer Milwaukee Ry., Miles City, Montana.
- Locke, Jerome G., B. C. E., 1908; Military Service, A. E. F. France.
- Lorentz, Floyd S., B. E. E., 1907; E. E., 1910; Electrician Anaconda Copper Mining Company, Great Falls, Montana.
- Lott, Mortimer J., B. S., 1915; Farmer, Twin Bridges, Montana.
- Lund, Janelle E., B. S., 1917; Mrs. B. W. Whitlock, Seattle, Washington.
- Lund, Helen, B. S., 1918; Artist in Entomology Dept., Mont. Exper. Sta., Bozeman, Montana.
- Luther, Edith W., B. S., 1917; Deceased.
- Luther, Glenn, B. S., 1912; Military Service, Co. D, 4th Engineers Corps, A. E. F. France.
- McCabe, John, B. S., 1918; Westinghouse Company, Pittsburg, Pa.
- McCone, Alice, B. S., 1918; Instructor in Home Economics, Libby, Mont.
- Mackey, Warren, B. S., 1913; Draughtsman, Anaconda Copper Mining Company, Anaconda, Montana.
- Malsor, Roy E., B. S., 1915; Engineer with Belts Construction Co., Spokane, Washington.
- Manning, J. M. W., B. S., 1917; Military Service, 2nd Lieutenant, Co. G., 363 Infantry, France.
- Martin, Claude A., B. S., 1914; Civil Engineer, Great Northern Railway, Great Falls, Montana.
- Maynard, Edna, B. S., 1900; M. S., 1903; Mrs. Garfield T. Morris, Alameda, California.
- Metheney, Blanche, B. S., 1911; Mrs. Ralph Kuschke, Sheridan, Wyo.
- Miewald, Ethel, B. S., 1916; Teacher of Domestic Science and English, Chinook, Montana.
- Milburn, Geo. R., B. S., 1916; Military Service, American Exp. Forces, Aviation Section Signal Corps, France.
- Millegan, Homer D., B. S., 1914; Farmer and Stockgrower, Millegan, Montana.
- Millegan, Guy J., B. S., 1912; Farmer and Stockgrower, Millegan, Mont.
- Milnor, Estelle, B. S., 1917; Chemist; Camp Cody, N. Mex.

- Monforton, Zoe, B. S., 1901; Mrs. H. C. Patterson, Pasadena, California.
- Monson, William, B. S., 1917; Deceased.
- Moore, Ellie J., B. S., 1901; Farmer and Insurance Agent, Bozeman, Montana.
- Morgan, Carl F., B. S., 1915; Farmer, Joliet, Montana.
- Morgan, George W., B. S., 1912; Assistant in Dry Land Agriculture, U. S. D. A., Havre, Montana.
- Morgan, Joseph D., B. S., 1912; Assistant Grain Standardization Bureau, U. S. D. A., Kansas City, Mo.
- Morgan, Oliver P., B. S., 1896; Deceased.
- Morris, Harry Elwood, B. S., 1909; Assistant Botanist and Bacteriologist, Experiment Station, Bozeman, Montana.
- Morris, Garfield T., B. C. E., Senior Civil Engineer in the Valuation Department Inter-State Commerce Commission, Pacific Division, Alameda, California.
- Mountjoy, Agnes, B. S., 1907; Mrs. Harry Mickelson, Opheim, Montana.
- Mountjoy, Irvin, B. E. E., 1908; Farmer, Cardwell, Montana.
- Myers, Ada Mae, B. S., 1915; Mrs. Jay Jacobs, Billings, Montana.
- McCormick, C. E., B. S., 1916; Instructor in Agriculture, Helena Schools, Helena, Montana.
- McCraw, John L., B. S., 1912; Deceased.
- McIver, Grace F., B. S., 1917; Stenographer, Great Falls, Montana.
- McSpadden, F. E., B. S., 1917; County Agent, Great Falls, Montana.
- Nash, Lewis, B. S., 1904; Farmer, Clyde Park, Montana.
- Noble, Edward G., B. S., 1915; Supt. of Exper. Sta., Investigating Southern Crops, Yuma, Arizona.
- Noble, Erma, B. S., 1909; M. S., 1910; Mrs. E. McCarthy, Townsend, Montana.
- Noble, Ruth A., B. S., 1917; Mrs. E. E. Dawson, Great Falls, Montana.
- Noble, Florence, B. S., 1918; Instructor in Art, Gallatin County High School, Bozeman, Montana.
- Nordquist, Clark, B. S., 1917; Military Service.
- O'Connor, William, B. S., 1916; Farmer, Red Lodge, Montana.
- O'Connor, Frank, B. S., 1918; Military Service, 2nd Lieutenant, 59th Machine Gun Battalion, Camp Sevier, S. C.
- Osborne, Belle, B. S., 1907; Mrs. D. E. Fish, Mount Pleasant, Iowa.
- Osenberg, Albert, B. S., 1916; Military Service, Signal Corps, San Antonio, Texas.
- Papke William C., B. S., 1915; Farmer, Bozeman, Montana.
- Pease, Jay L., B. S., 1907; Farmer, Bozeman, Montana.
- Peck, Harry S., B. S., 1911; Electrical Engineer, Milwaukee Electrical Department, Butte, Montana.
- Penwell, Clyde C., B. S., 1906; B. E. E., 1907; Montana Power Company, Great Falls, Montana.
- Penwell, Clyde W., B. E. E., 1907; Montana Power Company, Great Falls, Montana.

- Peters, Orville S., B. S., 1909; E. E., 1912; Assistant Physicist, Bureau of Standards, Washington, D. C.
- Peterson, Jas. A., B. S., 1909; Lawyer, St. Paul, Minnesota, 1322 Capitol Avenue.
- Pettigrew, Leslie R., B. S., 1915; Military Service, Senior Lieutenant, Bancroft Hall, U. S. Navy, Annapolis, Md.
- Philpott, June, B. S., 1911; M. S., 1912; Laboratory Assistant, Bureau of Standards, Washington, D. C.
- Piedalue, Aimee M., B. S., 1915; Stenographer, Bozeman, Montana.
- Piedalue, Laura, B. S., 1912; Instructor in Home Economics, Helena High School, Helena, Montana.
- Piedalue, Irene M., B. S., 1911; Social Service Work, Spokane, Wash.
- Pippinger, Harold, B. S., 1918; Hdq. Co. 62nd Infantry, Camp Lee, Petersburg, Va.
- Pool, Florence E., B. S., 1915; Home Economics, Extension Department, Agricultural College, Fargo, North Dakota.
- Pool, Louis K., B. S., 1910; City Engineer, Townsend, Montana.
- Pope, Alger, B. S., 1918; Military Service, A. E. F. France.
- Potter, Ermine L., B. S., 1906; Professor of Animal Husbandry, Oregon Agricultural College, Corvallis, Oregon.
- Potter, John V., B. S., 1915; Military Service, 2nd Lieutenant, Ordnance, U. S. Army.
- Quaw, Eugene, B. S., 1911; Military Service, Camp Lewis, Wash.
- Quaw, Lucille, B. S., 1903; Teacher of English, Broadwater County High School, Townsend, Montana.
- Quaw, Mignon, B. S., 1902; Assistant State Leader of Home Demonstration Agents, Bozeman, Montana.
- Quaw, Thomas B., B. S., 1907; Military Service, U. S. Army, Austria.
- Quaw, Marjorie, B. S., 1918; Bozeman, Montana.
- Rapatz, Eugene, B. S., 1917; Montana Power Company, Great Falls, Montana.
- Reddick, Theodore, B. S., 1918; Military Service, 2nd Lieutenant, Co. B, 60th Machine Gun Battalion, Camp Sevier, S. C.
- Reese, Herbert J., B. S., 1904; Military Service, U. S. Army, American Lake, Wash.
- Richter, Frederick A., B. S., 1914; Military Service, France.
- Riddell, Marsa, B. S., 1916; Nurse, Murray Hospital, Butte, Montana.
- Ritz, Gladys, B. S., 1918; Chemist, State Board of Health, Helena, Mont.
- Robinson, J. W., B. S., 1908; Grain Buyer for International Milling Co., Minneapolis, Minnesota.
- Roecher, Rausie, B. S., 1914; Mrs. Selmer Solberg, Big Timber, Mont.
- Romney, G. Ott, B. S., 1916; Instructor in English and Athletics, Brigham Young University, Peova, Utah.
- Ronne, Edwin M., B. S., 1917; Military Service Aviation Field, Hampton, Virginia.
- Ross, Thos., B. S., 1918; Rancher, Chinook, Montana.
- Rothwell, Howe, B. S., 1918; Civil Engineer, Columbus, Montana.

- Rowe, Mary, B. S., 1918; Mrs. S. Hieronymus, Secretary to Registrar, Montana State College, Bozeman, Montana.
- Sacket, Nathalie, B. S., 1913; Teacher High School, Livingston, Mont.
- Sacket, Chas. T., B. C. E., 1904; C. E., 1907; Military Service, Major, Engineers Corps, Washington, D. C.
- Sales, Reno H., B. S., 1898, Geologist, Anaconda Copper Mining Co., Butte, Montana.
- Saltz, Lawrence W., B. S., 1917; Chemist, Anaconda Copper Mining Co., Anaconda, Montana.
- Schabarker, W. W., B. M. E., 1902; Night Foreman, Shops Milwaukee Railroad, Milwaukee, Wisconsin.
- Schmidt, F. W., B. S., 1903; Mining Engineer, Sao Paulo, Brazil.
- Scholten, Henry, B. S., 1917; Chemist, Big Timber, Montana.
- Schumacher, F. W., B. S., 1914; U. S. Forestry Service, Deer Lodge, Montana.
- Scott, Parke T., B. S., 1917; Military Service, A. E. F. France.
- Seamans, Arthur, B. S., 1913; U. S. Government Experiment Service, Huntley, Montana.
- Seamans, Howard L., B. S., 1916; Special Field Agent for Montana Bureau of Entomology, U. S. D. A., Bozeman, Montana.
- Sewell, Gordon, B. S., 1918; Anaconda Copper Co., Anaconda, Montana.
- Shaw, W. T., B. S., 1896; Unknown.
- Shovell, Wm. L., B. S., 1912; Horticultural Expert, Hamilton, Montana.
- Sloan, J. Harvey, B. C. E., 1903; Aircraft Production Co., Buffalo, N. Y.
- Sloan, W. F., B. E. E., 1903; Consulting Engineer, Madison, Wisconsin.
- Sloan, Wm. Glenn, B. S., 1910; Government Drainage Engineer, Boise, Idaho.
- Smith, Alda, B. S., 1913; Mrs. Harold Clay, Charlotte, Michigan.
- Smith, Inez, B. S., 1916; Instructor in Home Economics, Gallatin County High School, Bozeman, Montana.
- Snider, Leta, B. S., 1911; Mrs. James A. Peterson, St. Paul, Minnesota.
- Snow, Manfred L., B. S., 1917; In charge of irrigation rotations, Huntley, Montana.
- Solberg, Selmer H., B. S., 1914; Merchant, Big Timber, Montana.
- Soper, Joseph, B. S., 1913; Naval Aviation Station, Quartermaster, 1st class, San Diego, California.
- Spain, J. Marvin, B. S., 1911; Homesteader, Edwards, Montana.
- Spain, Whitfield, B. S., 1909; Manager of Ranch, Belgrade, Montana.
- Spragg, Frank A., B. S. A., 1902; Plant Breed of Farm Crops, Michigan Experiment Station, Lansing, Michigan.
- Stadler, Marie, B. S., 1916; Mrs. Marie Stadler Cowan, Orono, Maine.
- Stafford, Lucy B., B. S., 1896; Mrs. William Peck, Pony, Montana.
- Stahlford, Ruby, B. S., 1917; Instructor in Home Economics, Three Forks, Montana.
- Stanley, Amelia, B. S., 1916; Assistant in Home Economics, Great Falls High School, Great Falls, Montana.

- Steel, David, B. S., 1916; Water Inspector for G. N. R. R., Great Falls, Montana.
- Steel, Hamilton, B. S., 1915; Deceased.
- Stranahan, Clinton, B. S., 1918; Rancher, Fort Benton, Montana.
- Strand, A. Leroy, B. S., 1917; Special Field Agent for Montana Bureau of Entomology, U. S. D. A., Bozeman, Montana.
- Streets, Rupert, B. S., 1918; Assistant State Leader of Barberry Eradication, Bureau of Plant Industry, Bozeman, Montana.
- Swan, Ulmont, B. S., 1918; Military Service, Co. 360, 90th Division, Zeltingen, Germany.
- Sweat, Ruth, B. S., 1916; County Superintendent, Teton County, Choteau, Montana.
- Switzer, Madge, B. S., 1914; Instructor of Home Economics, Gallatin County High School, Bozeman, Montana.
- Tavener, Frank, B. C. E., 1903; Consulting Engineer, Missoula, Montana.
- Taylor, Emma, B. S., 1915; Instructor of Home Economics, Belgrade Schools, Belgrade, Montana.
- Taylor, John C., B. S., 1912; Assistant County Agent Leader, Bozeman, Montana.
- Thomas, David, B. S., 1917; Engineer, Valier, Montana.
- Thompson, A. Paul, B. S., 1915; First Assistant Chemist Electrolytic Zinc Plant, Great Falls Reduction Works, Anaconda Copper Mining Company, Great Falls, Montana.
- Thompson, Homer C., B. S., 1902; President Three Valleys Cooperative Association, Three Forks, Montana.
- Thorpe, Elizabeth, B. S., 1907; Instructor of Mathematics, High School, Salt Lake City, Utah.
- Thorpe, Mabel A., B. S., 1907; Mrs. J. A. Thaler, Bozeman, Montana.
- Tracy, Edna B., B. S., 1908; Mrs. John White, Bozeman, Montana.
- Tremper, Wm. G., B. S., 1911; Civil Engineer, Helena, Montana.
- Truitt, C. Alonzo, B. S., 1915; Civil Engineer for Burns & McDonnell, Kansas City, Missouri.
- Truman, Ida R., B. S., 1917; House Keeper, Bozeman, Montana.
- Truman, Joseph K., B. S., 1913; Electrical Engineer Montana Power Company, Canyon Ferry, Montana.
- Udem, Louis, B. S., 1917; Military Service, 1st Lieutenant Co. M, 356 Infantry, Prum, Germany.
- Vestal, Wm. B., B. S., 1914; Engineer, Spokane, Washington.
- Vreeland, Edna, B. S., 1909; Mrs. Robt. K. Plues, Los Angeles, Calif.
- Wade, Arthur M., B. S., 1911; Military Service, A. E. F. France.
- Walchli, Fred, B. S., 1910; Mechanical Engineer, Kalispell, Montana.
- Walker, Cecil, B. S., 1916; Mrs. Walter Willson, Tucson, Arizona.
- Webster, Alden, B. S., 1914; Electrical Draftsman, Corps of Engineers, U. S. Army, Washington, D. C.
- Wells, Roscoe, M. S., 1917; Special Agent in U. S. D. A., Bureau of Entomology, Dallas, Texas.
- Wharton, John C., B. S., 1913; Stockman, Wisdom, Montana.

- Whipple, Chas. A., B. S., 1917; Military Service, Bugler, First Class, Machine Guns Co., 12th Infantry, Camp Alexander, Va.
- Whiteside, John, B. S., 1917; Deceased.
- Widener, Carl C., B. S., 1908; City Engineer, Bozeman, Montana.
- Wilcomb, Maxwell J., B. S., 1915; Assistant City and County Engineer, Livingston, Montana.
- Wilcox, Guy M., B. S., 1917; Farmer, Dupuyer, Montana.
- Willey, Leroy, B. S., 1913; Dry Land Office, U. S. Department of Agriculture, Sheridan, Wyoming.
- Williams, Frank B., B. M. E., 1899; Engineer, State School of Deaf and Blind, Boulder, Montana.
- Williams, Roy B., B. S., 1911; Civil Engineer, Power, Montana.
- Williams, Sidney A., B. S., 1911; Electrical Engineer, H. J. Heinz Company, Pittsburg, Pa.
- Williams, Lee, B. E. E., 1902; County Surveyor and City Engineer, Deer Lodge, Montana.
- Willson, Walter G., B. S., 1913; Westinghouse Electrical and Mfg. Co., Tucson, Arizona.
- Wilson, Elva, B. S., 1909; Mrs. N. P. Nelson, Three Forks, Montana.
- Wilson, Kathleen, B. S., 1915; Mrs. David Steel, Great Falls, Montana.
- Wolpert, Harold E., B. S., 1912; Working in Smelter, Mullen, Idaho.
- Wylie, Lawrence, B. S., 1913; 1st Lieutenant, A. S. 278th Aero Squadron, A. E. F. France.
- Wylie, Mary, B. S., 1910; Instructor, Hamilton Public Schools, Hamilton, Montana.
- Young, Mrs. Verna T., B. S., 1915; Home Demonstration Agent, Butte, Montana.

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PUBLICATIONS of THE UNIVERSITY of MONTANA

Copies of the several series of the University of Montana Bulletin, of the University of Montana Circular, and of the University of Montana Syllabi, may be obtained upon request from the President of the particular institution concerned. Copies of the University of Montana Studies and of the General Series of the Bulletin and of the Circular will be furnished from the office of the Chancellor of the University.

I. UNIVERSITY OF MONTANA BULLETIN

Each series of the Bulletin is issued quarterly, and contains annual reports, catalogues, etc.

1. GENERAL SERIES (Office of the Chancellor).
2. STATE UNIVERSITY SERIES.
3. COLLEGE OF AGRICULTURE AND MECHANIC ARTS SERIES.
4. EXPERIMENT STATION SERIES.
5. NORMAL COLLEGE SERIES.
6. SCHOOL OF MINES SERIES.
7. ALUMNI SERIES.

II. UNIVERSITY OF MONTANA CIRCULAR

Each series of the Circular is issued at irregular intervals and contains various special announcements.

1. GENERAL SERIES (Office of the Chancellor).
2. STATE UNIVERSITY SERIES.
3. COLLEGE OF AGRICULTURE AND MECHANIC ARTS SERIES.
4. EXPERIMENT STATION SERIES.
5. EXTENSION SERVICE SERIES.
6. NORMAL COLLEGE SERIES.
7. SCHOOL OF MINES SERIES.

III. UNIVERSITY OF MONTANA STUDIES

Issued quarterly, and contains the contributions resulting from the investigation and research in the several departments and divisions of the University excepting those of the Agricultural Experiment Station, which are issued in the Bulletin.

IV. UNIVERSITY OF MONTANA SYLLABI

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2. COLLEGE OF AGRICULTURE AND MECHANIC ARTS SERIES.
3. NORMAL COLLEGE SERIES.
4. SCHOOL OF MINES SERIES.

UNIVERSITY OF MONTANA BULLETIN

College of Agriculture and Mechanic Arts Series

No. 17

COLLEGE OF AGRICULTURE AND MECHANIC ARTS

Colleges of Agriculture, Engineering,
Applied Science, Household and Industrial Arts,
Courses in Vocational Education,
Secondary Schools of Agriculture,
Home Economics, Mechanic Arts.

TWENTY-SEVENTH ANNUAL CATALOGUE

1919-1920

ANNOUNCEMENTS FOR
1920 - 1921

BOZEMAN, MONTANA
MAY, 1920

THE UNIVERSITY OF MONTANA

EDWARD C. ELLIOTT, Chancellor of the University.

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, Approved March 14, 1913, (effective July 1, 1913).

The general control and supervision of the University are vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

Montana State Board of Education

S. V. STEWART, Governor	Ex-officio, President
S. C. FORD, Attorney General.....	Ex-officio
MAY TRUMPER, Supt. of Public Instruction.....	Ex-officio, Secretary
W. S. HARTMAN.....(1920)	C. H. HALL.....(1922)
JOHN DIETRICH .....(1921)	LEO H. FAUS.....(1923)
A. LOUIS STONE.....(1921)	W. H. NYE.....(1923)
J. BRUCE KREMER .....(1922)	WM. M. BOLE.....(1923)

The University comprises the following institutions, schools and departments:

The State University, Missoula

Established February 17, 1893, and consisting of

The College of Arts and Sciences	The School of Education
The School of Law	The School of Business Administration
The School of Pharmacy	The Summer Quarter
The School of Forestry	The Biological Station
The School of Journalism	(Flathead Lake)
The School of Music	The Public Service Division
	The Graduate Division.

EDWARD O. SISSON, President.

The State College of Agriculture and Mechanic Arts, Bozeman

Established February 16, 1893, and consisting of

The College of Agriculture	The Summer Quarter
The College of Engineering	The Secondary Schools
The College of Applied Science	Agriculture
The College of Household and Industrial Arts	Home Economics
Courses for Vocational teachers	Mechanic Arts
The School of Music	The Agricultural Experiment Station
	The Agricultural Extension Service

ALFRED ATKINSON, President.

The State School of Mines, Butte

Established February 17, 1893.

CHARLES H. CLAPP, President.

The State Normal College, Dillon

Established February 23, 1893, and consisting of

The Teachers' Certificate Course	The Four-years Course
The Three-years Course	The Rural Teachers' Course
	Teachers' Service Division.

SHELDON L. DAVIS, President.

For publications and detailed information concerning the different schools and colleges address the President of the particular institution concerned. Communications intended for the Chancellor of the University should be addressed to the State Capitol, Helena, Montana.

UNIVERSITY OF MONTANA BULLETIN

College of Agriculture and Mechanic Arts Series

No. 17

COLLEGE OF AGRICULTURE AND MECHANIC ARTS

Colleges of Agriculture, Engineering,
Applied Science, Household and Industrial Arts,
Courses in Vocational Education,
Secondary Schools of Agriculture,
Home Economics, Mechanic Arts.

TWENTY-SEVENTH ANNUAL CATALOGUE

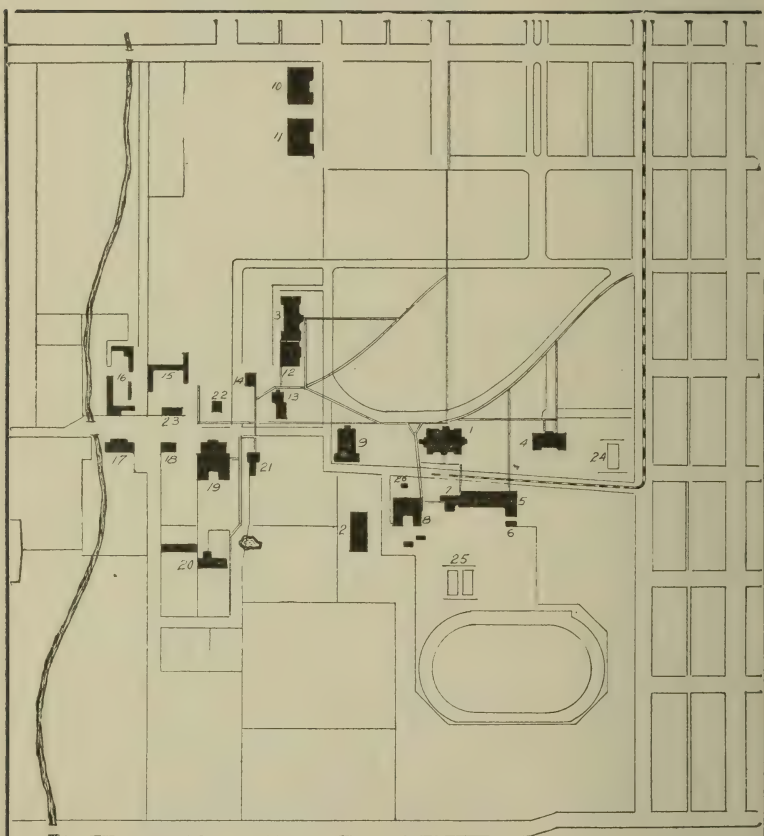
1919-1920

ANNOUNCEMENTS FOR
1920 - 1921

BOZEMAN, MONTANA
MAY, 1920

Entered at Bozeman, Montana, as Second Class Matter Under Act of Congress
August 24, 1912





- | | |
|-----------------------------|---------------------------|
| 1—Montana Hall | 14—Grain Laboratory |
| 2—Chemistry Building | 15—Implement Sheds |
| 3—Agricultural Hall | 16—Sheep Barn and Piggery |
| 4—Hamilton Hall | 17—Feeding Barn |
| 5—Engineering Laboratory | 18—Granary |
| 6—Cement Laboratory | 19—Cattle Barn |
| 7—Heating Plant | 20—Poultry House |
| 8—Shops | 21—Veterinary Building |
| 9—Gymnasium and Drill Hall | 22—Club House |
| 10—Barracks | 23—Horse Barn |
| 11—Men's Dormitory | 24—Tennis Court for Women |
| 12—Horticultural Greenhouse | 25—Tennis Courts |
| 13—Biology Building | |

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1920

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Calendar

1920-1921

SPRING QUARTER

1920

March 27, Saturday	Registration Day
March 29, Monday	Instruction Begins
May 7, Friday	Standing of Students Reported
May 30, Sunday	Memorial Day
June 13, Sunday	Baccalaureate Address
June 16, Wednesday	Commencement
June 16-18, Wednesday-Friday	Examinations

SUMMER QUARTER

June 21, Monday	First Term Begins
July 4, Sunday	Independence Day
July 30, Friday	First Term Ends
August 2, Monday	Second Term Begins
September 3, Friday	Second Term Ends

AUTUMN QUARTER

Sept. 28-29, Tuesday-Wednesday.....	Registration Days
September 30, Thursday	Instruction Begins
November 7, Saturday	Standing of Students Reported
Nov. 25-27, Thursday-Saturday.....	Thanksgiving Recess*
Dec. 20-22, Monday-Wednesday.....	Examinations and Registration
Dec. 22, Wednesday, 4:30 p. m.....	Quarter Ends; Christmas Recess Begins.

WINTER QUARTER

1921

January 3, Monday	Registration of New Students
January 4, Tuesday	Christams Recess Ends; Instruction Begins.
February 12, Saturday	Standing of Students Reported
March 9-12, Wednesday-Saturday.....	Interscholastic Basketball Tournament.
March 23-25, Wednesday-Friday.....	Examinations and Registration.

SPRING QUARTER

March 26, Saturday	Registration Day
March 28, Monday	Instruction Begins
May 7, Saturday	Standing of Students Reported
May 30, Monday	Memorial Day, a Holiday*
June 12, Sunday	Baccalaureate Address
June 15, Wednesday	Commencement
June 15-17, Wednesday-Friday.....	Examinations

SUMMER QUARTER

June 20, Monday	First Term Begins
July 4, Monday	Independence Day, a Holiday*
July 29, Friday	First Term Ends
August 1, Monday	Second Term Begins
September 2, Friday	Second Term Ends

AUTUMN QUARTER

Sept. 26-27, Monday-Tuesday	Registration Days
September 28, Wednesday	Instruction Begins
November 12, Saturday	Standing of Students Reported
Nov. 24-26, Thursday-Saturday.....	Thanksgiving Recess*
Dec. 20-22, Tuesday-Thursday.....	Examinations and Registration
Dec. 22, Thursday, 4:30 p. m.....	Quarter Ends; Christmas Recess Begins.

*No days are holidays unless specially designated in the calendar.

Official Directory

EXECUTIVE BOARD

ALFRED ATKINSON (ex-officio), Chairman.....	Bozeman
J. H. BAKER (term expires April 1923).....	Bozeman
W. S. DAVIDSON (term expires April 1921).....	Bozeman
ALLEN CAMERON, Secretary-Treasurer	Bozeman

ADMINISTRATIVE OFFICERS

EDWARD C. ELLIOTT, Ph. D.	Chancellor, University of Montana
ALFRED ATKINSON, M. S.,	President
FREDERICK B. LINFIELD, B. S. A.,.....	Director, Experiment Station
FRED S. COOLEY, B. S.,	Director, Extension Service
JAMES M. HAMILTON, M. S.,.....	Dean of Men
UNA B. HERRICK	Dean of Women
JOHN H. HOLST, M. A.,.....	Principal Secondary Schools and Director Summer Session.
ROY ORVIS WILSON, B. S.....	Registrar
MARSA RIDDELL, B. S.....	House Director at Hamilton Hall
ANKER CHRISTENSON	Acting Superintendent of Buildings
ADELE MCCRAY	College Nurse
RAY B. BOWDEN	Editorial Director

THE FACULTY

Professors

ABBEY, MYRON J.....	Professor of Agricultural Education A. B., Brown University, 1902.
*ARNETT, CLARE NEWTON.....	Professor of Animal Husbandry B. S. A., Purdue University, 1907.
ATKINSON, ALFRED.....	President and Professor of Agronomy B. S., Iowa State College, 1904; M. S. Cornell University, 1912.
BALDWIN, LANA A.....	Professor of Applied Art
BALES, ALBA	Professor of Home Economics B. S., Columbia University, 1917.
BREWER, WILLIAM F.....	Professor of English A. B., Grinnell College, 1891; A. M., 1897; A. M. Harvard University, 1899.
BUBB, JOHN	Professor of Military Science and Tactics Captain U. S. Army.
CARDON, PHILIP VINCENT.....	Professor of Agronomy B. S., Utah Agricultural College, 1909.
COBLEIGH, WILLIAM M.....	Professor of Chemistry and Chemical Engineering A. M., Columbia University, 1899.

*Resigned—November 1, 1919.

- CONKLING, LEON D.....Professor of Civil Engineering
C. E., Cornell University, 1900.
- COOLEY, ROBERT A.....Professor of Entomology and Zoology
B. S., Massachusetts Agricultural College, 1895.
- CURRIER, AARON H.
Director School of Music and Professor of Vocal Music
A. B., Oberlin College, 1892; A. M., 1894.
- FORREST, ELIZABETH Librarian
B. L. S., University of Illinois, 1906; A. M., University of Chicago, 1917.
- HAM, FRANKProfessor of Physics
B. S., Montana State College, 1903; M. S., 1905.
- HAMILTON, JAMES M.
Dean of Men and Professor of Economics and Sociology
B. S., Union Christian College, 1887; M. S., 1890.
- HERRICK, UNA B.....Dean of Women's Work and Director of
Physical Education for Women
- HOLST, JOHN H.
Principal of Secondary Schools, Director of the Summer Session,
and Assistant Professor of English.
A. M., University of Montana, 1918.
- LINFIELD, FREDERICK B.....Dean of Agriculture
B. S. A., Ontario Agricultural College, 1891.
- MARTIN, GEORGE LESTER.....Professor of Dairy Husbandry
B. S., Iowa State College, 1908.
- NASH, W. GIFFORDProfessor of Piano Music
- NORRIS, EARLE B.Dean of Engineering and Professor of
Mechanical Engineering
B. S., Pennsylvania State College, 1904; M. E., 1908.
- O'GORMAN, JAMES M.....Professor of Psychology and Education
B. S., Columbia University, 1909; M. A., 1910.
- *PLEW, WILLIAM R.....Professor of Architectural and Civil Engineering
B. S., Rose Polytechnic Institute, 1907; M. S., 1910.
- POWELL, WALTER DANIEL.....Professor of Physical Education
A. B., University of Wisconsin, 1914.
- SCHOPPE, WILLIAM F.....Professor of Poultry Husbandry
B. S., University of Maine, 1907; M. S., 1913.
- SWINGLE, DEANE B.....Professor of Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.
- TALLMAN, WILLIAM D.....Professor of Mathematics
B. S., University of Wisconsin, 1896.
- THALER, JOSEPH A.....Professor of Electrical Engineering
E. E., University of Minnesota, 1900.

*On leave of absence—University of Illinois.

WELCH, HOWARD Professor of Veterinary Science
A. B., University of Missouri, 1902; B. S. A., 1906; D. V. M., Cornell University, 1909.

***WHIPPLE, ORVILLE B.** Professor of Horticulture
B. S., Kansas State Agricultural College, 1904.

WILSON, ROY ORVIS Professor of Secretarial Studies and Registrar
B. S., South Dakota State College, 1911.

Associate Professor

DUDDY, EDWARD A. Associate Professor of English
A. B., Bowdoin College, 1907; A. M., Harvard University, 1918.

Assistant Professors

BREWER, HELEN R. Assistant Professor of History
A. B., Grinnell College, 1888.

CHALLENGER, RALPH T. Assistant Professor of Trades and Industry
B. S., Kansas State Agricultural College, 1908; M. E., 1918.

CURRIER, EDWIN L. Assistant Professor of Farm Management
B. S., University of Nebraska, 1912.

FORD, CARLOTTA MARKS Assistant Professor of Home Economics
A. B., University of Illinois, 1911.

FRANKS, EDITH Assistant Professor of Home Economics

GARRISON, EMMA PAULINE Assistant Professor of Home Economics
B. S., Columbia University, 1919.

GIESEKER, LEONARD F. Assistant Professor of Agronomy
B. S., University of Nebraska, 1908; M. S., Cornell University, 1914.

HATFIELD, WILLIAM D. Assistant Professor of Chemistry
B. S., University of Illinois, 1914; M. S., 1916; Ph. D., 1918.

HOLMES, WILLIAM BARTHOLOMEW Assistant Professor of
Secretarial Studies
B. S., James Milliken University, 1913.

JENNISON, HARRY M. Assistant Professor of Botany and Bacteriology
B. S., Massachusetts Agricultural College, 1908; M. A., Wabash College, 1911.

JOSEPH, WALTER EDWARD Assistant Professor of Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.

KIEFER, JAMES A. Assistant Professor of Physics
B. S., Montana State College, 1914.

MURDOCK, HARVEY E. Assistant Professor of Farm Mechanics
B. S., University of Colorado, 1906; M. E., 1908; C. E., University of Colorado, 1911.

MCCHORD ROBERT C. Assistant Professor of Animal Husbandry
A. B., Central University, 1908; B. S. A., Iowa State College, 1913.

QUINN, EDMOND JOHN Assistant Professor of Chemistry
B. S., Notre Dame University, 1911.

*Resigned March 1, 1920.

- SLOAN, ROYAL D.**.....Assistant Professor in Electrical Engineering
B. S., Montana State University, 1913.
- **SNOW, FRANK C.**.....Assistant Professor of Civil Engineering
C. E., Ohio State University, 1906.
- ***SPAULDING, MILO H.**.....Assistant Professor of Zoology
A. B., Leland Stanford Junior University, 1903; A. M., 1906.
- STARRING, CECIL C.**.....Assistant Professor of Horticulture
B. S., South Dakota State College, 1911.
- SUMNER, HARLAN R.**.....Assistant Professor of Agronomy
B. S. A., Kansas State Agricultural College, 1916; M. A., University of Missouri, 1917.
- THERKELSEN, ERIC**
Assistant Professor of Electrical and Mechanical Engineering
B. S., University of Washington, 1911; M. S., 1913.
- WALLIN, FLORENCE**.....Assistant Professor of French and Spanish
A. B., State University of Iowa, 1907.

Instructors

- BULL, FRIEDA M.**.....Instructor in Mathematics
B. S., Montana State College, 1907; M. S., 1909.
- DONALDSON, JESSIE**..... Instructor in English
A. B., University of Minnesota, 1913.
- GRANT, EUGENE L.**.....Instructor in Civil Engineering
B. S., University of Wisconsin, 1917.
- HARTMAN, JUNE**Instructor in Piano Music
B. S., Montana State College, 1910.
- HOMANN, FREDERICK C.**Instructor in Mechanical Engineering
B. S., Montana State College, 1916.
- HOWARD, LOUIS L.**.....Instructor in Band Music
- KATELEY, FRED**Instructor in Forge and Foundry
- LUDWIG, ALFRED**Instructor in Mechanical Engineering
C. E., Rensselaer Polytechnic Institute, 1889.
- MAXWELL, LORA**.....Instructor in Physical Education
B. Pd., Montana State Normal College, 1911.
- MOORE, MURIEL**Instructor in Art
- MCCART, DORIS**..... Instructor in English
B. A., Depauw University, 1916; M. A., University of Chicago, 1918.
- *PARK, JOHN C.**.....Instructor in Mechanical Engineering
- RANDALL, LAURA**Instructor in Home Economics
B. S., University of Minnesota, 1917.
- SEAMANS, HOWARD L.**.....Instructor in Entomology and Zoology
B. S., Montana State College, 1916.

*Resigned December 15, 1919.

**Resigned December 31, 1919.

***On leave of absence—Leland Stanford Junior University.

- SIBLEY, GERTRUDE M..... Instructor in **English**
A. B., Mount Holyoke College, 1913.
- TRETSVEN, OSCARInstructor in **Animal Husbandry**
- YOUNG, DELLA A.....Instructor in **Stenography and Typewriting**
Pd. M., Colorado Teachers' College, 1917; A. B., 1918.

Assistants

- ABBOTT, MABEL L..... Assistant **Librarian**
A. B., University of Minnesota, 1902; Graduate New York Pub. Library, 1914.
- HUMPHREY, LEO C.....Assistant in **Chemistry**
B. S., Montana State College, 1919.
- NORRIS, EARL R.....Assistant in **Chemistry**
B. S., Montana State College, 1919.
- PARKER, MAE E..... Assistant in **English**
A. B., Mount Holyoke College, 1909.
- QUAW, MARJORIEAssistant in **Applied Art**
B. S., Montana State College, 1918.

EXPERIMENT STATION STAFF

- LINFIELD, FREDERICK B..... **Director**
B. S. A., Ontario Agricultural College, 1891.

Department Heads

- *..... **Animal Husbandry**
- CARDON, P. V..... **Agronomy**
B. S., Utah Agricultural College, 1909.
- BURKE, EDMUND**Chemistry and Meteorology**
B. S., Montana State College, 1907.
- COOLEY, ROBERT A..... **Entomology**
B. S., Massachusetts Agricultural College, 1895.
- CURRIER, EDWIN L..... **Farm Management**
B. S., University of Nebraska, 1912.
- WHITCOMB, WILLIAM O.....**Superintendent of Grain Laboratory**
B. S., A., North Dakota Agricultural College, 1909; M. S. A., Cornell University, 1913.
- MURDOCK, HARVEY E..... **Agricultural Engineering**
B. S., University of Colorado, 1906; M. E., 1908; C. E., 1911.
- SCHOPPE, WILLIAM F..... **Poultry**
B. S., University of Maine, 1907; M. S., 1913.
- SWINGLE, DEANE B.....**Botany and Bacteriology**
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.
- WELCH, HOWARD **Veterinary**
A. B., University of Missouri, 1902; B. S. A., 1906; D. V. M., Cornell University, 1909.

*Vacancy to be filled.

****WHIPPLE, ORVILLE B.**..... Horticulture
B. S., Kansas State Agricultural College, 1904.

Department Assistants

BLISH, MORRIS J...... Chemistry
B. S., University of Nebraska, 1912; A. M., 1913; Ph. D., University of Minnesota, 1915.

DAY, W. FRIEND..... Grain Laboratory

GIESEKER, LEONARD F...... Agronomy
B. S., University of Nebraska, 1908; M. S. A., Cornell University, 1914.

JONES, RAY S...... Chemistry
B. S., Montana State College, 1915.

JOSEPH, W. E...... Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.

MCCHORD, ROBERT C...... Animal Husbandry
A. B., Central University, 1908; B. S. A., Iowa State College, 1913.

MORRIS, ERNEST..... Agronomy

MORRIS, H. E...... Botany and Bacteriology
B. S., Montana State College, 1909; M. S., University of Wisconsin, 1917.

NELSON, JOSEPH B...... Agronomy

NUTTING, GRACE B...... Botany and Bacteriology
B. Ph., University of Vermont, 1915.

PARKER, JOHN R...... Entomology
B. S., Massachusetts Agricultural College, 1908.

PINCKNEY, REUBEN M...... Chemistry
B. S., Nebraska Wesleyan University, 1906; A. M., University of Nebraska, 1908.

PLUMB, C. W...... Station Clerk

STARRING, CECIL C...... Horticulture
B. S., South Dakota State College, 1911.

STEWART, MILDRED V...... Chemistry
B. S., University of Wisconsin, 1918.

SUMNER, HARLAN R...... Agronomy
B. S. A., Kansas State Agricultural College, 1916; M. A., University of Missouri, 1917.

TRETSVEN, OSCAR..... Animal Husbandry

*..... Farm Management

**Resigned March 1, 1920.

*Vacancy to be filled.

SUB-STATION STAFF

Judith Basin Substation, Moccasin

- OSENBERG, ALBERT Acting Superintendent
 B. S., Montana State College, 1916.
 MAY, RALPH W. Assistant
 B. S., Kansas Agricultural College, 1918.

North Montana Substation, Havre

- MORGAN, GEORGE Superintendent
 B. S., Montana State College, 1912.
 WOODWARD, NORVAL F. Assistant
 B. S., Washington State College, 1912.

Huntley Substation, Huntley

- HANSEN, DAN Superintendent
 SEAMANS, ARTHUR Assistant
 B. S., Montana State College, 1913.

Horticultural Substation, Corvallis

- THORNBUR, HARVEY Superintendent
 B. S., Washington State College, 1911.

AGRICULTURAL EXTENSION STAFF

- COOLEY, FRED S. Director
 B. S., Massachusetts Agricultural College, 1888.
 *BEERS, WAYLAND L. State Leader of Market Specialists
 A. B., Brown University, 1895.
 CAMPBELL, J. R. State Leader Extension Schools and Meetings
 B. S. A., Iowa State College, 1909; M. S., 1911.
 COPELAND, A. J. Farm Management Demonstrator
 B. S., Ohio State University, 1915.
 **FULLER, FRANK E. Field Agent in Agronomy
 B. S., Kansas Agricultural College, 1911; B. S., Iowa State College, 1917.
 GRABER, MARY ANN. Assistant State Leader of Home
 Demonstration Agents
 B. S., Ohio State University, 1915.
 HAMPTON, SAMUEL J. Lecturer
 JENNISON, HARRY M. Extension Botanist
 B. S., Massachusetts Agricultural College, 1908; M. A., Wabash College, 1911.
 LOTT, ELMO HAMILTON. Assistant State Leader of County Agents
 B. S., Cornell University, 1912; B. S. A., Iowa State College, 1917.

*Resigned March 31, 1920.

**Resigned March 1, 1920.

- OGAARD, ARTHUR J.**..... Extension Agronomist
B. S., North Dakota Agricultural College, 1913.
- OGILVIE, MINA**.....Assistant State Leader of Boys' and Girls' Clubs
B. S., Kansas Agricultural College, 1912.
- POTTER, C. E.**.....State Leader of Boys' and Girls' Clubs
B. S., West Virginia University, 1919.
- QUAW, MIGNON M.**.....Assistant State Leader of Home Demonstration Agents.
B. S., Montana State College, 1902; M. A., Columbia University, 1910.
- REYNOLDS, LUCILLE W.**, Assistant State Leader of Home Demonstration Agents.
- RILEY, EDWARD H.**.....State Leader of Live Stock Specialists
B. S. A., University of Minnesota, 1903; D. V. M., George Washington University, 1911.
- ROOSEVELT, GEORGE A.**.....Field Agent in Rodent Control
- ROOSEVELT, GEORGIA C.**.....Clothing Specialist
B. S., Montana State College, 1914.
- SMITH, R. L.**Poultry Specialist
B. S., University of Maine, 1912.
- ROWE, BESS M.**.....State Leader of Home Demonstration Agents
B. S., University of Minnesota, 1910.
- TAYLOR, JOHN C.**.....Assistant State Leader of County Agents
B. S., Montana State College, 1912.
- TOMSON, W. E.**.....State Specialist in Dairying
B. S., Kansas Agricultural College, 1912.
- WILSON, MILBURN LINCOLN**.....State Leader of County Agents
B. S. A., Iowa State College, 1907.

County Agents

- ANDERSON, A. D.**.....Chouteau County, Fort Benton
- ANDERSON, E. W.**.....Sheridan County, Plentywood
B. S. A., Iowa State College, 1914.
- BANKER, PAUL P.**.....Hill County, Havre
B. S., University of Wisconsin, 1912.
- BODLEY, RALPH E.**..... Gallatin County, Bozeman
B. S., University of Nebraska, 1912.
- BROICH, WALTER F.**.....Rosebud County, Forsyth
B. S. A., Oklahoma A. and M. College, 1913; M. S., Oregon Agricultural College, 1915.
- BROSSARD, H. S.**.....Yellowstone County, Billings
B. S., Utah Agricultural College, 1916.
- CHASE, FLOYD J.**..... Roosevelt County, Mondak
B. S., University of Nebraska, 1912.
- CLARKSON, ROBERT E.**.....Teton County, Choteau
B. S., Montana State College, 1917.

- GORDON, W. R.....Broadwater County, Townsend
B. S. A., West Virginia University, 1916.
- HILLMAN, FRANK M.....Sanders County, Thompson Falls
B. S., University of Minnesota, 1912.
- JONES, W. H.....Stillwater County, Columbus
B. S. A., West Virginia University, 1915.
- LEWIS, GROVER E.Prairie County, Terry
B. S., Utah Agricultural College, 1916.
- MANNING, J. W.....Lewis and Clark County, Helena
B. S., Montana State College, 1917.
- MACSPADDEN, F. E.....Cascade County, Great Falls
B. S., Montana State College, 1917.
- McKEE, R. B.Flathead County, Kalispell
B. S., North Dakota Agricultural College, 1916.
- MENDENHALL, DEANE W.....Dawson County, Glendive
B. S., North Dakota Agricultural College, 1914.
- MICHELS, CHARLES A.....Toole County, Shelby
B. S., North Dakota Agricultural College, 1909; M. S., University of Wisconsin, 1912.
- PETERSON, CARL H.....Fergus County, Lewistown
- POLLINGER, W. E.....Missoula County, Missoula
- *SCOTT, ROY S.....Musselshell County, Roundup
B. S. A., University of Illinois, 1917.
- SPAIN, MARVINMusselshell County, Roundup
B. S., Montana State College, 1911.
- SPRING, L. H.Ravalli County, Hamilton
B. S. A., Oregon Agricultural College, 1910.
- STAPLETON, W. P.....Phillips County, Malta
B. S. A., North Dakota Agricultural College, 1913.
- STEBBINS, MURRAY E.....Valley County, Glasgow
B. S., North Dakota Agricultural College, 1916.
- THORFINNSON, M. A.....Blaine County, Chinook
B. S. A., North Dakota Agricultural College, 1917.
- YERRINGTON, C. M.....Custer County, Miles City
B. S., North Dakota Agricultural College, 1914.

County Club Leaders

- KAUFFMAN, H. N.....Flathead County, Kalispell
A. B., Wetttemberg College, 1911.

Home Demonstration Agents

- BORTHWICK, ALBERTA.....Cascade County, Great Falls
B. S., Montana State College, 1916.
- ERICKSON, GERTRUDEValley and Roosevelt Counties, Glasgow

*Resigned December 1, 1919.

- FOSTER, INEZ**..... Missoula County, Missoula
B. S., University of Minnesota, 1915.
- HEIDNER, BARBARA**..... Blaine and Phillips Counties, Chinook
B. S., North Dakota Agricultural College, 1916.
- HOTT, NORA M.**..... Fergus County, Lewistown
B. S., Kansas State Agricultural College, 1914.
- KELLEY, JEANETTE A.**..... Stillwater County, Columbus
B. S., Montana State College, 1917.
- KYTE, GLADYS**..... Flathead County, Kalispell
B. S., University of Wisconsin, 1919.
- SWAN, INEZ B.**..... Lewis and Clark County, Helena
- WILLIS, MINA A.**..... Yellowstone County, Billings
B. S., University of Wisconsin, 1913; M. S., 1914; B. S., University of
Idaho, 1918.
- *WOOD, CHRISTINE (MRS. W. GREENE)**..... Flathead County, Kalispell
B. S., Washington State College, 1913.

*Resigned December 1, 1919.

SUMMER QUARTER

JOHN H. HOLST Director
M. A., University of Montana, 1918.

THE FACULTY

BALES, ALBA Home Economics
B. S. Columbia University, 1917.

BALDWIN, LANA Art

CARDON, PHILIP V. Agriculture
B. S., Utah Agricultural College, 1909.

CHALLENGER, RALPH T. Trade and Industry
B. S., Kansas State Agricultural College, 1908; M. E., 1918.

CURRIER, AARON H. Vocal Music
A. B. Oberlin College, 1892; A. M., 1894.

GARRISON, EMMA PAULINE Domestic Art
B. S. Columbia University, 1919.

HAMILTON, JAMES M. Economics and Sociology
B. S. Union Christian College, 1887; M. S. 1890.

HOLST, JOHN H. English
M. A. University of Montana, 1918.

HAM, FRANK Physics
B. S. Montana State College 1903; M. S., 1905.

HOLMES, WILLIAM B. Secretarial Work
B. S. James Milliken University, 1913.

HARTMAN, JUNE Piano
B. S. Montana State College, 1910.

KATELEY, FRED Mechanic Arts

LUDWIG, ALFRED Mechanical Drawing
C. E., Rensselaer Polytechnic, 1889.

MARTIN, GEORGE LESTER Dairy Husbandry
B. S. Iowa State College, 1908.

O'GORMAN, JAMES M. Education
B. S. Columbia University, 1909; M. A. 1910.

- QUINN, E. J. Chemistry
B. S. Notre Dame University, 1911.
- QUAW, MIGNON M. Community Recreation
B. S. Montana State College, 1902; M. A. Columbia University 1910.
- SCHOPPE, WILLIAM F. Poultry Husbandry
B. S. University of Maine, 1908; M. S., 1913.
- SEAMANS, HOWARD L. Botany and Zoology
B. S., Montana State College, 1916.
- SUMNER, HARLAN R. Agronomy
B. S. A. Kansas State Agricultural College, 1916; M. A. University of
Missouri, 1917.
- STARRING, CECIL C. Horticulture
B. S. South Dakota State College, 1911.
- TALLMAN, WILLIAM D. Mathematics
B. S., University of Wisconsin, 1896.

FACULTY COMMITTEES

ATHLETICS:

Swingle, Powell, Duddy.

BUILDINGS AND GROUNDS:

Linfield, Norris, ———

ELIGIBILITY FOR ATHLETICS:

Atkinson, Schoppe, Quinn.

GRADUATE STUDIES:

Cooley, Thaler, O'Gorman.

INSTRUCTION:

Cobleigh, Miss Bales, Holst.

INTERSCHOLASTIC:

Powell, Duddy, Jennison, Tallman, Wilson.

LIBRARY:

Brewer, Joseph, Miss Ford, Cooley, Miss Brewer.

MILITARY CREDIT AND ADVANCED STANDING:

Conkling, Swingle, Holst, Schoppe.

NEW COURSES:

Ham, Tallman, Brewer.

PUBLICATIONS:

Brewer, Wilson, Bowden.

PUBLIC EXERCISES:

Atkinson, A. H. Currier, Mrs. Herrick.

RECOMMENDATIONS FOR POSITIONS:

Wilson, Miss Bales, Thaler.

REGISTRATION:

Ham, Miss Brewer, Duddy, Tallman.

SCHOLARSHIP AND STUDENT ATTENDANCE:

Conkling, Ham, Mrs. Herrick, Hamilton, Schoppe.

STATE FAIR:

Parker, Miss Baldwin, Joseph, Wilson, Plew.

STUDENT AFFAIRS:

Mrs. Herrick, Wilson, McChord, Hamilton, Powell.

STUDENT LOANS:

Linfield, Mrs. Herrick, Norris, Hamilton, Cameron.

SUMMER SESSION:

Holst, Conkling, Cobleigh, O'Gorman, Miss Bales.

University of Montana

HISTORICAL SKETCH

An Act of Congress approved February 18, 1881, dedicated for university purposes in Montana, seventy-two sections of the public domain. The Enabling Act, providing for the organization of the State of Montana and its admission to the Union, February 22, 1889, confirmed this grant to the State and added one hundred thousand acres for a school of mines, one hundred thousand acres for normal schools, and one hundred and forty thousand acres for an agricultural college.

The Third Legislative Assembly of the State of Montana, in February, 1893, enacted laws providing for the establishment of all these institutions, and locating the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon, and the State Agricultural College at Bozeman.

As the lands granted for higher educational purposes, together with timber or stone thereon, have been sold, the proceeds have gone into permanent funds invested for the various institutions, and the interest on these funds, together with the rentals of unsold lands, have been used for the support of the respective institutions. These maintenance resources have been supplemented with appropriations made each subsequent biennium by the Legislative Assembly, which has also provided for the erection of buildings at the expense of the State.

These institutions were administered independently by local executive boards for some years under the general supervision of the State Board of Education; by a law of 1909 the powers of the local boards were more closely defined and the direction of the State Board of Education made more effective. By the enactment of Chapter 92 of the Laws of the Thirteenth Legislative Assembly in 1913 the four institutions were combined into the University of Montana under the executive control of an officer whose title is Chancellor. In October, 1915, the State Board of Education appointed Edward C. Elliott, then of the University of Wisconsin, as the first Chancellor of the University of Montana. He assumed his duties February 1, 1916.

College of Agriculture and Mechanic Arts

HISTORICAL SKETCH

By an Act of the Third Legislative Assembly of Montana, signed by Governor J. E. Rickards, February 16, 1893, the Agricultural College of the State of Montana was located at Bozeman. This Act provided for an Executive Board which should have the immediate control and direction of the affairs of the College, subject only to the general supervision of the State Board of Education. The Executive Board was authorized to appoint a secretary and treasurer and to choose a president and faculty.

On March 21, 1893, the State Board of Education held its first meeting at Bozeman. A site of forty acres for campus was donated by Nelson Story, Sr. An adjoining one hundred and sixty acres of land, owned by Gallatin county, was donated, one-half by the county and one-half by the citizens of Bozeman. An Executive Board was appointed. The Executive Board chose Luther Foster for Acting President. On April 17, with the President and an assistant, instruction was begun. September 15, the College opened for its first full year's work. A. M. Ryon was president and the faculty numbered six. Courses were offered in agriculture, domestic economy, and applied science, the last being chiefly engineering and chemistry. There was also established a one-year preparatory course, a two-years business course, modeled after the usual private business college, and a music department.

Nelson Story, Sr., donated the use of a frame building which had been occupied as a Presbyterian Academy. The public school board allowed the use of some rooms in a nearby school building. During the summer of 1894 the brick veneer building now used for biology was erected out of the Hatch Experiment Station Fund.

The Legislative Assembly in 1895 authorized bond issue of \$100,000.00 to provide funds to erect and furnish buildings for the college.

By the enactment of Chapter 92 of the laws of the Thirteenth Legislative Assembly in 1913, the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon, and the State Agricultural College at Bozeman were combined into the University of Montana, under the executive control of an officer whose title is Chancellor.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Section 16 grants ninety

thousand acres of land to Montana for the use and support of an agricultural college according to the terms of the Act of Congress, July 2, 1862, and Section 17 grants an additional fifty thousand for the same purpose and subject to the same conditions and limitations as the other grant. The one hundred and forty thousand acres of land cannot be sold for a price less than ten dollars per acre and the principal, together with all money received from the sale of timber, is to be invested as a permanent endowment. The unsold land may be leased, and the rental, together with the interest on the permanent endowment, shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriates twenty-five thousand dollars annually out of the treasury of the United States. By the Nelson Bill passed March 3, 1907, this amount was increased annually by five thousand dollars each year beginning in 1907 until now the total annual appropriation has reached fifty thousand dollars, at which figure it is to remain.

The Smith-Hughes Act of Congress, February, 1917, provides a plan for Vocational Education in Agriculture, Home Economics and the Trades and Industry. The training of teachers under the federal plan for Vocational Education as authorized by the Smith-Hughes Act is the work of the College. The federal government makes an annual appropriation of \$5,000.00 and the State Legislature a like amount.

PURPOSE AND SCOPE

The purpose of the college of agriculture and mechanic arts is chiefly to provide collegiate education in agriculture, engineering, home economics, and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in the act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for the

further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture and mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893, accepts these grants of land and money and provides that the Montana State College shall have for its object "Instruction and education in the English language, literature and mathematics, civil and mechanical engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology and such other natural sciences as may be prescribed by the State Board of Education; political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

THE COLLEGE CAMPUS AND FARM

The grounds and farm contain four hundred acres. Forty acres in the immediate vicinity of the buildings constitute the campus and recreation grounds, which are in lawn, interspersed with flower beds, shrubbery trees and driveways. On the campus are located a quarter-mile track, a baseball diamond, a football field, and three cement tennis courts. The remainder is used for farming and experimental purposes.

BUILDINGS

Montana Hall is situated in the center of the college campus. It is three stories high, and has a basement, which furnishes quarters for the departments of physics and history and a part of the library. On the first floor are offices for the president, registrar and secretary, a class room, and the south half of the first floor contains the reading room and library, and an office for the librarian. The north half of the second floor is devoted to the art department, the arrangement being such that three large rooms can be thrown together by sliding doors. The south of the second floor is devoted to the departments of mathematics and secretarial studies. The third floor contains the large assembly hall and seven class and music rooms.

Hamilton Hall is the dormitory for women. The rooms are single and in suites, and all rooms have both hot and cold water. In the basement are the store rooms, laundry, quarters for servants,

kitchen, and large dining room. The first floor contains reception rooms, the dean's suite, guest room, and a number of rooms for students. The second and third floors are for students.

Agricultural Hall is a four-story building. The north half of the first floor contains the quarters for dairying, consisting of store rooms, office, class room, butter and cheese rooms, and laboratories. The south half of this floor is used for horticulture, and has seed room, office, class rooms, work room, and laboratory. The north half of the second floor is occupied by the agronomy department, with office, class room, dry land office, soil and grain laboratories. In the south half are offices for the director of the experiment station, director of the extension service, class room, office and laboratory for the department of animal husbandry. Most of the third floor is devoted to home economics and contains two large kitchen laboratories, a dining room, two class rooms, two sewing rooms, and office.

The fourth floor has an assembly room and class rooms for secondary students; and offices for members of the extension staff.

Adjoining the Agricultural Hall on the south is the greenhouse, in the center of the front is a palm room, and on both sides flower and vegetable rooms. Through the center is a plant breeding room and on the west a propagating room.

The new and modern Chemistry Building is a reinforced concrete, fireproof structure, and is heated by a steam direct-indirect system, which provides ample ventilation for all rooms. In addition there is a separate ventilation system for the hoods. Pipe lines for water, drainage, air pressure, vacuum, hot water, distilled water and hydrogen sulphide have been provided. Several of the laboratories are provided with electric circuits for both heat and power.

The sub-basement contains rooms for the ventilation machinery, and the mechanical equipment required to operate the vacuum and air pressure systems. The sub-basement also furnishes quarters for storage and for the preparation of samples for analysis by the chemistry department of the Experiment Station.

The laboratories for agricultural, organic, food chemistry and analytical chemistry are located in the basement. The basement also furnishes quarters for a food and drug laboratory and for a water and sewage laboratory where the work required by the State Board of Health in enforcing the State Food Law and some of the State sanitary laws, is carried on. A large laboratory for industrial chemistry and chemical engineering is also located in the basement.

The department office and library, a class room, and the research laboratories of the chemistry department of the Experiment Station are located on the first floor.

The second floor furnishes quarters for the laboratory of general

chemistry, a store room, a fuel laboratory, two offices, and a large lecture room seating about two hundred students.

The attic floor furnishes quarters for the geological collections and a mineralogical laboratory. On this floor there is a room housing the distilling apparatus which provides distilled water to be distributed to all laboratories, and a room for a hydrogen sulphide generator, to which are connected the pipe lines furnishing the laboratories with hydrogen sulphide.

The Biology Building is three stories with basement. On the top floor are a lecture room and a museum containing the zoological collection. On the floor below are three laboratories for bacteriology, botany, and zoology, and an office and work room for the botanist. The west half of the first floor is a large laboratory for general biology, and the east half is occupied by the office, library and work room for the entomologist. The basement contains work rooms, class rooms, store rooms, herbarium room, and dark room. Attached to this building on the south is a greenhouse for botanical purposes, and an insectary, for the study of living insects. The greenhouse is divided into two rooms, one for experimental work, and the other for laboratory use.

The Engineering Laboratory is a two-story building, with a frame annex. The first floor contains the dynamos, motors, and other machinery and apparatus, offices and students' reading room. The second story is occupied by the storage battery, photometer and electric light rooms, class rooms and offices. The first floor of the annex contains the cement laboratories, and the second floor is used for electrical designing. There is also laboratory space, occupied by material testing machines, a refrigerating machine, various steam and gas engines, tractors, etc. This last named laboratory also contains a large flume for hydraulic testing and a weir box for determining constants used for various forms of weirs. Adjoining the laboratory on the west is the heating plant for the college.

The Shops contain a forge shop, a machine shop, an office, a wash room, and a tool room. It has one wing for wood work, and another for foundry use.

The Barracks, built for the Students' Army Training Corps, have been converted into dormitories for men. There are rooms for study and recreation, sleeping rooms, a large dining hall, a well equipped kitchen, and shower baths.

The Gymnasium is a frame building. On the ends and the sides are permanent seats, amphitheater style. It furnishes a convenient place for gymnasium practice, basketball and other indoor athletics. An addition at the rear and sides provides a director's office, two

locker rooms, dressing rooms for women, shower and needle bath rooms, and a material room.

The College Farm Buildings are eight in number, located on the college farm adjacent to the campus. These buildings are the dairy barn, veterinary building, horse barn, beef cattle barn, sheep barn, seed barn and granary, the piggery and poultry plant.

COLLEGE SURROUNDINGS

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee & St. Paul railroad. For convenience, healthfulness and beauty of surrounding the location is unsurpassed. The College is situated on an elevation which commands a view of one of the most fertile valleys in the world, covered far and wide with grain fields, and surrounded on all sides by lofty mountains.

Bozeman is a city of homes and churches, with a wholesome moral environment. It is a most desirable residence city for families who wish to educate their children. The college is reached from the railroad stations and city by an electric car line.

EXPENSES OF STUDENTS

BOARD AND ROOM FOR MEN

The Barracks, built by the State and Federal Government for the accommodation of the S. A. T. C., have been converted into living quarters for men students. They are equipped with dormitories, kitchens, dining rooms, study rooms, game rooms, shower baths, and all facilities for comfort and convenience.

The rate for board and room is \$22.50 per month, with an additional charge of fifty cents per month for laundry. A deposit of \$5.00 is charged to cover breakage, damage or unnecessary expense caused by accident, carelessness or intention. The unused portion of the deposit will be refunded at the end of the year.

Fraternity houses are maintained by students which accommodate a number for board and room. Students who do not live in the men's dormitory may find room and board in private families convenient to the college, for \$35 to \$40 per month. The total college expenses for the year, including fees, books, room, board and incidental expenses, may be estimated from \$400 to \$500. A list of approved places with prices and accommodations is kept in the Registrar's office. A committee of students meets all trains on registration

days and at other times on request, and aids in finding satisfactory locations.

BOARD AND ROOM FOR WOMEN

Hamilton Hall is the college home for women. The Hall is under the supervision of the house director, and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to location and size of room. Because of the unusual fluctuation of food costs the following prices are subject to change at any time during the year:

One in single room	\$36.00
Two in single room (each)	\$34.50
Two in double room (each)	\$35.00
Two en suite (each)	\$38.00
Three en suite (each)	\$36.00

The above prices are for a calendar month. Of these amounts \$29.00 is for table board and the remainder for room rent. Application for rooms in the hall may be made at any time to the house director, and must always be accompanied by a deposit of \$5.00 to insure a reservation. This amount will be returned if the house director is notified before September 26th, or will be deposited until the room is vacated. When a room is vacated if, in the judgment of the house director, the room and furniture have not been injured more than could be expected from the ordinary wear and tear, the \$5.00 shall be refunded. If either the room or the furniture has been injured more than would be due to ordinary wear and tear, such portion of the \$5.00 shall be retained by the institution as will be needed to make good the damage. All freshmen women entering the institution are required to live in Hamilton Hall for the entire college year. All other women reserving room in Hamilton Hall will be expected to continue residence for the entire college year unless they withdraw from the institution. Residents who leave the Hall before the close of the quarter will be required to pay the room rent till the end of the quarter. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of \$1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before registration day, and no deduction will be made for late arrivals. The Hall will not be open for occupancy until the day before registration day. No deduction is made for absence at week-ends or during vacations, except at the Christmas holidays, when room rent only will be paid. The residents may have guests at meals by making arrangements for same at the house

director's office the day before, and may also have the privilege of the laundry by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have same laundered; also white scrim curtains, a napkin ring and any room decorations they may fancy.

RAILROAD FARE REFUNDS

In accordance with the provisions of Chapter 123 of the Session Laws of 1917, enacted by the Fifteenth Legislative Assembly, and under regulations established by the State Board of Education, railroad fare in excess of five dollars actually paid by any student for a round trip between his Montana home and any institution of the University of Montana once each year, will be refunded.

No war tax that has been paid by any student will be refunded under any conditions whatever.

FEES AND DEPOSITS

A fee is a fixed charge, no part of which is returnable except as specified under refunds. A deposit is intended to serve as a security against losses and breakage. Any unused balances are returnable.

Registration Fee \$10.00

Payable annually in advance by each college student in attendance during the autumn, winter, or spring quarter. In no case will any part of the fee be refunded.

Short Course Registration Fee \$ 6.00

Payable annually in advance by each student in the School of Agriculture, the School of Home Economics and the School of Mechanic Arts. In no case will any part of this fee be refunded.

Registration Fee, Summer Quarter.....\$10.00

Payable in advance by all students attending the summer quarter. In no case will any part of this fee be refunded.

Associated Students Activity Fee \$ 7.50

Payable annually in advance by all college students entering the autumn quarter. Students entering the winter or spring quarter pay \$2.50 per quarter.

Associated Short Course Students Activity Fee.....	\$ 5.00
Payable annually in advance by each student in the School of Agriculture, the School of Home Economics, and the School of Mechanic Arts. Students entering the winter quarter pay \$2.50 per quarter.	
Late Registration Fee, during the first week of the Quarter.....	\$ 2.00
Payable by students registering after the prescribed registration days of any quarter, except students entering for the first time.	
Fee for Removing Conditions	\$ 2.00
Payable by students who take condition examinations at times not regularly designated in the calendar.	
Limited Registration Fee, each course, per quarter.....	\$ 2.00
Payable by special students registering for not more than two courses. The total credits for the courses shall not exceed six.	
Special Attendance Fee, each course, per quarter.....	\$ 2.00
Payable by adults not regularly registered but attending classes as listeners.	
Library Deposit	\$ 3.00
Payable by all students.	
Men's Dormitory Deposit	\$ 5.00
Payable by all men who live at the men's dormitory.	
Hospital Fee, per quarter	\$ 2.00
Payable by all students.	

Note:—The following fees and deposits are given per quarter:

Agriculture

Number of Course	Fee.	Deposit
Agronomy: 1, 2, 11	\$1.00	\$1.00
Agronomy: 5,	1.00	.00
Animal Husbandry: a, b, c, 1, 1a, 2, 2a, 3, 6.....	1.00	.00
Animal Husbandry: e, f 11,	2.00	.00
Dairy: 1, 2,	2.00	1.00
Dairy: a,	2.00	1.00
Dairy: b, c, d,	1.00	1.00
Horticulture: 1, 1a,	1.00	1.00
Horticulture: 4,	5.00	.00
Horticulture: a, 6,	1.00	.00
Poultry Husbandry: 46, 48,	1.00	.00
Veterinary Science: 51,	2.00	.00

Art

	Fee.	Deposit
Art: a, b, 1, 1a, 1b, 2, 2a, 3, 3a, 4, 7, 7a, 7c, 8a, 8b, 8c, 15, 16, 18a, 18b.....	.50	.00
Art: 8, 11, 12, 13, 14.....	3.00	.00
Art: 10	2.00	4.00
Art: 19	1.00 to 5.00	.00

Botany and Bacteriology

Botany: a	1.00	.00
Botany: 1	2.00	2.00
Botany: 2, 4, 5	3.00	.00
Botany: 3	3.00	3.00
Botany: 6	4.00	2.00
Botany: 11	1.00	4.00
Bacteriology: 12, 14	4.00	3.00
Bacteriology: 15	3.00	2.00

Chemistry

Chemistry: 1	5.00	3.00
Chemistry: a, 2, 3, 4, 5, 8, 9, 11, 12, 14, 17, 18....	4.00	4.00
Chemistry: 7	6.00	4.00
Chemistry: 23	2.00	2.00

Engineering

Architectural: 1, 4, 0, 11, 14, 15, 16.....	1.00	.00
Civil: 1, 1a, 2, 4, 9, 28, 30, 32, 39.....	1.00	2.00
Civil: 8, 34, 38, 44	2.00	2.00
Civil: 46	1.00	1.00
Electrical: 4, 10, 14a,	1.00	5.00
Mechanical: 2, 2a, 4, 4a, 6, 9, 21, 27.....	2.00	2.00
Mechanical: 34	1.00	2.00
Mechanical: 15, 15a, 20, 22a, 28, 32.....	2.00	.00

Entomology and Zoology.

Zoology: 1, 2, 3, 12, 13, 15,	3.00	.00
Entomology: 4, 5, 6, 7.....	2.00	.00
Entomology: 8	3.00	.00
Entomology: 10	2.00 to 10.00	

Home Economics

	Fee	Deposit
Home Economics: 1a,	1.50 to 3.50	
Home Economics: a, b, 4a, 12, 14, 16, 18.....	1.00	.00
Home Economics: c,	1.50	.00
Home Economics: e, 11, 13, 17, 17a.....	2.00	.00
Home Economics: d, j, 7, .....	.50	.00
Home Economics: g, 2, 8, 11b,	3.00	.00
Home Economics: 4, 6,	4.00	.00
Home Economics: 10 .....	.00	.50 to 6.00
Home Economics: h, 1b, 1c,	2.50	.00

Mechanic Arts

Mechanic Arts: a, b, d, e, g,.....	2.00	2.00
Mechanic Arts: f, h, j, j1,.....	4.00	4.00
Mechanic Arts: s,	2.00	.00

Mineralogy

Geology: 2,	4.00	4.00
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Physics

Physics: a, c, 1a, 2, 4, 5, 9, 14, 16.....	1.00	1.00
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Secretarial

Secretarial: 3, 4,	1.00	.00
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Trades and Industry

Trades and Industry: 1, 2, 6,	3.00	.00
Trades and Industry: 3,	1.00	.00
Trades and Industry: 5,	3.00	2.00

Music

	Fees.	
Piano, one half-hour lesson per week.....	\$15.00 to	\$18.00
Piano, two half hour lessons per week.....	27.00 to	33.00
Piano, ensemble playing	7.00	
Voice, one half hour lesson per week.....	18.00	
Voice, two half hour lessons per week	33.00	
Piano rent, one hour per day.....	4.00	
Piano rent, each additional hour per day.....	3.00	

Dormitory Room and Board

Woman's Dormitory Room and Board, a month.....	\$35.00 to \$38.00
Depending on room.	
Men's Dormitory Room and Board, a month.....	\$22.50

Special Fees for Summer Quarter

	Fee	Deposit
Art: 1, 2, 3,.....	.50	
Chemistry: 1,	5.00	3.00
Chemistry: a, 5,	4.00	4.00
Chemistry: 7,	6.00	4.00
Home Economics: 1a,	2.50	
Home Economics: 1b, 11,	2.00	
Home Economics: 12, 13,	1.00	
Mechanic Arts: b,	2.00	2.00
Mechanic Arts: e,.....	1.00	
Mechanic Arts: s,	2.00	
Physics: a, 2, 5,	2.00	
Secretarial Work: 3,	1.00	

REFUND OF FEES**Registration Fees:**

Registration fees, (including summer quarter registration, late registration, limited registration, and special attendance fees), will not be refunded under any circumstances.

Associated Students Activity Fees:

Students who have entered the autumn quarter and paid the annual associated student activity fee will receive a refund of one half the amount paid if they leave at or before the close of the autumn quarter. There will be no refund on account of withdrawals after the opening of the winter quarter.

Music Fees:

When music students withdraw before the end of the quarter, \$1.50 will be retained for each lesson period up to the time of withdrawal, and any balance remaining will be refunded.

No piano rentals will be refunded.

Laboratory Fees:

Students withdrawing by the beginning of the second week of any quarter will receive a refund of 90% of the laboratory fees paid for the quarter. Those withdrawing by the beginning of the seventh week will receive a refund of 40% of the laboratory fees paid for the quarter.

REQUIREMENTS FOR ADMISSION

Applicants for admission must be at least sixteen years of age and must present evidence of good moral character.

The completion of a high school or preparatory course of four years is the standard for regular entrance to the freshman class. This must include at least fifteen units of work. The term unit means one subject pursued for at least thirty-six weeks with not fewer than five recitations per week of forty-five or more minutes each. Two periods of laboratory, shop, or drawing work count the same as one recitation.

Applicants for admission without condition to the freshman class must present three units in English composition and literature and are advised to include among the required fifteen units at least the following:

Mathematics, 2 units.

Science, 1 unit.

History, 1 unit.

Admission without condition to the courses in engineering requires three years of mathematics and one year of physics.

Candidates for admission to the school of home economics and mechanic arts and the school of agriculture must have completed the eighth grade in the public schools or its equivalent. There are no set requirements for music and the short agricultural courses, all being admitted who give evidence of being able to profit by the work.

ADMISSION ON CERTIFICATES

Graduates of the accredited high schools of Montana obtain admission by presenting certificates of principals stating subjects taken, time given for each, and grades obtained.

Blanks for such certificates are furnished by the registrar. These should be secured, filled out and filed in the registrar's office on or before the first day of registration.

LIST OF ACCREDITED HIGH SCHOOLS

1919-1920.

District High Schools: Alberton, Anaconda, Augusta, Baker, Belgrade, Belt, Big Sandy, Billings, Bridger, Broadview, Butte, Camas Prairie, Cascade, Chinook, Collins, Columbia Falls, Columbus, Conrad, Corvallis, Culbertson, Cutbank, Darby, Ekalaka, Fairview, Florence-Carleton, Forsyth, Fromberg, Geraldine, Glasgow, Great Falls, Hamilton, Hardin, Harlem, Harlowton, Havre, Helena, Hobson, Hysam, Ismay, Joliet, Jordan, Judith Gap, Laurel, Libby, Malta, Manhattan, Medicine Lake, Moore, Plains, Plentywood, Polson, Pony, Poplar, Ronan, Rosebud, Roundup, St. Ignatius, Scobey, Shelby, Sher-

idan, Sidney Stanford, Stevensville, Stockett, Superior, Terry, Thompson Falls, Three Forks, Toston, Valier, Victor, Virginia City, Whitefish, Whitehall, White Sulphur Springs, Wilsall, Winnett, Worden.

County High Schools: Beaverhead, (Dillon); Broadwater, (Townsend); Carbon, (Red Lodge); Chouteau, (Fort Benton); Custer, (Miles City); Dawson, (Glendive); Fergus, (Lewistown); Flathead, (Kalispell); Gallatin, (Bozeman); Granite, (Phillipsburg); Jefferson, (Boulder); Lincoln, (Eureka); Missoula, (Missoula); Park, (Livingston); Powell, (Deer Lodge); Sweet Grass, (Big Timber); Teton, (Choteau); Wibaux, (Wibaux).

Private Schools: Academy of Montana Wesleyan College, (Helena); Academy of Mt. St. Charles College, (Helena); Butte Business College, (Butte); Central High School, (Butte); Loyola High School, (Missoula); Mount Angela Ursuline Academy, (Great Falls); Polytechnic Institute, (Billings); Sacred Heart Academy, (Missoula); St. Vincent's Academy, (Helena).

Preparatory work done in other schools than those accredited may receive credit. Applicants from such schools should present certificates, stating the same points as those given from accredited schools. Blanks for this purpose are furnished by the registrar. When the evidence of certificate is not clear and satisfactory, examinations will be given.

Graduates of high schools not in Montana are admitted on certificates without examination, if such high schools are accredited to their own state universities.

ADMISSION ON EXAMINATION

Applicants wishing to receive entrance credits on subjects for which they do not present satisfactory certificates are required to take examinations on days prescribed in the calendar.

Those who are preparing to take entrance examinations should correspond with the registrar for suggestions in regard to such preparation.

CONDITIONAL ADMISSION

The entrance requirement of the completion of a four-years preparatory course, with at least fifteen units of credit, may be modified in individual cases by permitting the conditional admission of students otherwise qualified if they are entitled to at least thirteen admission units.

Entrance conditions must be removed within one year from the time of admission. This may be accomplished by private study or tutoring and the passing of entrance examinations; by arranging to take the requisite courses in the regular classes of the Gallatin

County High School; or by transferring certain college credit hours and counting them toward entrance standing instead of toward graduation.

ADMISSION OF SPECIAL STUDENTS

Students twenty-one years of age or older, not candidates for degrees may be admitted without the usual entrance units, as special students, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired.

Special students may acquire status as regular students and become candidates for degrees upon complying with the rules of admission and graduation.

ADMISSION TO ADVANCED STANDING

Students entering from collegiate departments of other colleges and universities must bring certificates of honorable dismissal.

Grades brought by a student from other institutions of approved standards will be accredited in this college, but only after personal conference with and approval by the head of the department in which credit is desired. Students must present note books for work in which they have had laboratory courses and desire advance credit.

CREDIT FOR WAR SERVICE

Credits toward the degrees of the college will be granted for definite and measurable attainments of mind resulting from service in the army and navy of the United States. The number of credits allowed for military service will be determined by the instructor in the branch in which application for credits is made, subject to the approval of the committee on military credit and advanced standing. Application for war service credits must be made by the student not later than twelve months after his discharge from service.

REQUIREMENTS FOR GRADUATION

Bachelor's Degree—Candidates for the bachelor's degree must complete satisfactorily one of the college courses. Students who are relieved for any reason of the requirements in military science or physical education shall present six additional credits in some other subjects.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course.

In calculating points A grade counts three times as many points as credits allowed for the subject, B grades twice as many points, C grades count the same number of points as credits, and D grades count nothing toward graduation.

All students who are candidates for the bachelor's degree must have completed all the required subjects listed in the course and a minimum of 204 credits.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors."

For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a quarter of recitation or lecture work, two or two and one-half hours a week for a quarter of laboratory, shop, library work, or drawing, shall count as one credit.

Attention is called to the fact that on October 1, 1917, the definition of the term credit was changed, by the transfer to the quarterly instead of the semester calendar. The new credit in time value counts just two-thirds as much as the old. Students who received credit on the books prior to October 1, 1917, in computing their standing by the present system should add fifty per cent to the number of credits and points.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one quarter, work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

ADVANCED DEGREES

Master's Degree—The Master of Science degree is conferred in the following departments: Botany and bacteriology, chemistry, entomology and zoology. To become a candidate the student must hold a bachelor's degree from the University of Montana or from another institution of equal rank approved by the committee on graduate studies of the State College of Agriculture and Mechanic Arts. The candidate will be required to meet the following conditions:

1. He shall name the particular branch of science in which he hopes to receive the degree and present evidence of sufficient preparation in this branch.

2. One full year or three quarters of residence study amounting to at least forty-five credits of work is required.

3. There shall be a major subject and one or two minor subjects and at least one half of the work must be done in the major subjects.

4. The major work shall be in advance of all undergraduate

courses of the college but the minor subjects may be selected from among courses pursued for the bachelor's degree. The minor subjects shall be approved in advance by the committee on graduate studies.

5. The head of the department in which the major work is selected shall be the candidate's class adviser.

6. With the aid of the adviser, the candidate shall prepare and submit in writing to the committee on graduate studies, not later than the second week of his resident study, a program of the work which he intends to do as a candidate for this degree. The committee will thereupon report to the candidate and the faculty its action on the candidacy.

7. The candidate shall present a thesis, which shall be a part of his major work.

8. The candidate will offer himself for examination in his major and minor studies. This examination will be under the supervision of the committee on graduate studies and may be oral or in writing. This committee will appoint a special examining committee.

Graduate students are required to pay the regular matriculation fee and all course fees. They will not, however, be expected to pay the student activity fee.

Engineering Degrees — The professional engineering degrees, Architectural Engineer, Chemical Engineer, Civil Engineer, Electrical Engineer, and Mechanical Engineer will be conferred on graduates who present satisfactory evidence of professional work of superior quality extending over a period of not less than three years. Candidates for these degrees will be required to meet the following conditions:

1. The candidate shall submit a record of his professional experience and the subject of his thesis to the committee on graduate studies for their approval not later than January first preceding commencement.

2. He shall present a bachelor's degree in the same branch of engineering in which he becomes a candidate for the advanced degree.

3. The candidate shall present a satisfactory thesis.

4. He shall offer himself for examination before a committee of the faculty, which shall be appointed by the committee on graduate studies.

REGISTRATION.

Time for Registration—The time set for registration of students is the first two days of the autumn quarter and the first day of each of winter and spring quarters. The class room work begins the first

day following registration day. Students will not be registered on days not listed for registration, except at the convenience of class advisers between four and five in the afternoon. Those who fail to present themselves for registration on the days designated for registration in any quarter, will be permitted to register later in the first week, only upon the payment of a special fee of \$2.00 in addition to regular fees.

Change of Registration—A student desiring to change his studies will present his request to his class adviser, who, after consulting all teachers interested, will take such action as he may deem best. A change in course of study is allowed only on the approval of the students' class adviser and the registration committee.

Registration by Mail—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening enclosing their credentials to the registrar of the college and should state the work which they wish to take. These documents will be examined and the student's classification will ordinarily be determined before his arrival so that much time in registration may be saved. Those who have already been enrolled in the institution should send a letter to their class adviser several days in advance of the registration days stating clearly the work which they plan to take and in case of elective subjects stating briefly the reasons for their choice.

If these steps are taken by students registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail as specified above should study carefully the entrance requirements for the courses in which they are interested and the prerequisites to the various subjects which they wish to take.

SCHOLARSHIP AND ATTENDANCE

Government—Students are expected to conduct themselves as ladies and gentlemen; those who fail to comply with this demand will be requested to leave the institution.

Leave of Absence—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

Honorable Dismissal—Students intending to sever their connection with the institution, either indefinitely or permanently, should

report as soon as possible to the president either in person or writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of a quarter), will not be readmitted to the college at any later time, nor will any report of grades in credit for work done here be sent out until satisfactory explanation is made.

Passing Grades—Passing grades are marked A, B, C, or D. An average standing from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures—Work not of a passing grade shall be marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade shall be marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is a condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions shall be held on the days designated in the college calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Scholarship—The names of students making grades of D, E, and F are reported to the registrar's office at intervals approximately six weeks apart, as indicated in the college calendar. Names of delinquent students are then reported to the scholarship committee, who immediately advise these students of their delinquencies. It is the sense of the faculty that students not passing in ten credits are wasting their time and the students and their parents are notified by the scholarship committee that if the students are not passing in ten credits at the next report on the standing of students they are to be recommended to the faculty for dismissal. The report on regular quarterly examinations is considered the same as any other report on standings, and students who fail at the end of any quarter to pass in ten credits must be passing at the time of the first report in the following quarter.

The names of delinquent students are sent to the chancellor, president, registrar, and class advisers concerned.

A student placed on probation by the Scholarship Committee shall lose all rights and privileges of membership in all student organizations and activities. This rule shall not apply to membership in a Fraternity or Sorority where the student placed on probation is a duly initiated member of such Fraternity or Sorority.

A student on probation shall not be absent from scheduled col-

lege exercises unless ill and attended by a regular physician or the college nurse.

No leave of absence shall be granted a student on probation except upon a written request from the parent or guardian.

Absences—Students absent from required exercises are reported at the close of each day to the registrar's office. On each Monday morning, there are posted on bulletin boards, the names of those students who are to appear before the absence committee. The committee, or one of its number, may be found each Monday afternoon at four o'clock in the office of the registrar, and deals with the cases of students whose names have been listed for consideration. In the case of frequent unwarranted absences, the committee shall bring the case before the faculty for discipline. These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors will not be reported until the instructor feels that members of these classes are wilfully remaining away from class and so wasting their time, and then these are to be reported to the absence committee for consideration and to the faculty for discipline. The instructors deal with tardiness in such manner as they deem best.

Assembly—Students are required to attend the assemblies held on each Friday during the college year, and all special assemblies. The programs of these assemblies consist of addresses, music recitals, illustrated lectures, etc.

MISCELLANEOUS INFORMATION

EMPLOYMENT AND AID FOR STUDENTS

A number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficient money to pay their expenses for one quarter unless they have engaged work in advance. The college cannot guarantee employment but those who are willing to give efficient, faithful service have usually found work.

A few students are employed as janitors and assistants in the shops, laboratories and barns. Others care for furnaces, work in stores and at various kinds of house work. Calls for young women students to work for their board and room are numerous.

Students readily find employment at profitable wages during the summer vacation.

Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

RESERVE OFFICERS' TRAINING CORPS

The State College has been designated by the war department as one of the institutions for higher education where provision will

be made for the maintenance of a Reserve Officers' Training Corps. The course outlined for this corps is entirely different from that of the S. A. T. C. It is practically the plan for military instruction which was in effect before the war. It includes a course in military drill and one in military science; it is required of freshmen and sophomores and is elective with juniors and seniors. Those who carry this course for four years are accepted as second lieutenants in the United States army for six months; if, at the end of that period, they elect to remain permanently in the army, they will receive commissions. Certain allowances for maintenances are made to juniors and seniors; freshmen and sophomores are supplied with uniforms. The time required for this course is three hours a week.

STUDENT ORGANIZATIONS

YOUNG WOMEN'S CHRISTIAN ASSOCIATION

The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this end it conducts devotional meetings Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work has been standardized and is supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. sends delegates to the Northwest Conference and keeps in touch with the state, national and international associations.

DEBATING

The management of the work in inter-class and intercollegiate debating, in extemporaneous speaking, and in oratory, is now vested in the manager appointed by the Associated Students, and the Coffee Club, which works in cooperation with the department of English. There is an established debate each year between the freshmen and sophomore classes. There are state contests in oratory and extemporaneous address and several intercollegiate debates.

THE EXPONENT

The students of the college maintain a weekly paper, The Exponent. The paper is well supported by the students and advertisers and is one of the most important student enterprises. It affords the members of the staff very valuable literary training.

ATHLETIC COUNCIL

This organization, composed of representatives from the faculty, alumni association and student body, has general control over all

branches of athletics. Football, basketball, baseball, track and tennis are at present recognized.

BRANCH OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

A branch of this society is maintained at the college. Regular monthly meetings are held at which original papers are read or those of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however, an Electrical club, which includes all the members of the Institute and all other students in the electrical engineering course.

BRANCH OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

The mechanical engineering students have a student engineering society affiliated with the American Society of Mechanical Engineers. Monthly meetings are held at which technical papers are presented by student members or by prominent mechanical engineers. All mechanical engineering students are eligible to membership.

THE CIVIL ENGINEERING SOCIETY

The students of the department of civil engineering organized this society for the purpose of promoting their interests in matters of practical importance to engineering students and the alumni. Prominent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field.

COLLEGE BAND

The college band is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments. One-half credit per quarter is allowed for those who register in band.

GLEE CLUB

Men are admitted upon examination as to musical qualifications and the membership is limited to about sixteen. Instruction and music are furnished free by the music department. Both popular and

high class works are studied. One-half credit per quarter is allowed those who register in glee club.

TREBLE CLEF CLUB

This club for young women corresponds in scope and work to the men's glee club. Membership is limited to about twenty. This club is also under the direction of the music department. Both Glee and Treble Clef clubs appear at college functions and recitals during the year. One-half credit per quarter is allowed those who register in this club.

CHORAL CLUB

Student singers of both sexes are admitted without formal examination. The Choral club was recently organized to foster more general interest in part singing. The material used ranges from college songs to high class part songs. With growth in membership larger choral works will be studied. The club has appeared on public programs with other musical organizations.

ORCHESTRA

Opportunity is given students who play any orchestral instrument to become members of the college orchestra, which contributes well selected numbers to public programs and plays an important part in assembly music and college "sings." One-half credit per quarter is allowed.

AGRICULTURAL SOCIETY

All agricultural students are eligible to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life.

HOME ECONOMICS CLUB

This club is composed of women students who are working for a degree in home economics. Meetings are held for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni of this department.

THE CHEMICAL SOCIETY

The students taking the chemical course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in regular

class work. Regular meetings are held and abstracts of recent journal articles are presented.

THE ALUMNAE CLUB

The active members of this organization are women graduates, residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

INTERFRATERNITY COUNCIL

An organization of women and men members of Greek letter fraternities. Its purpose is to stimulate effort in student activities, to advance the interests of the college, and to promote unity among the fraternal organizations for their individual and collective welfare, guidance and protection.

ASSOCIATED STUDENTS

An organization consisting of the whole body of students of the institution. The society is organized to manage all matters of general interest to students, as athletics, debates, oratory, and entertainments.

FRATERNITIES, SORORITIES, AND SOCIAL CLUBS

There are two fraternities which are, as yet, only local organizations, the Omega Beta, with a house on South Third avenue, and the Beta Epsilon, who maintain a house on West Babcock. The Sigma Chi, a national fraternity, has a chapter and maintains a house on South Third avenue and the Sigma Alpha Epsilon fraternity has a house on South Black avenue. There is also a club for men known as Les Bouffons. There are two national sororities, the Alpha Omicron Pi, with a house on South Fifth avenue, and the Phi Epsilon Omicron; a local sorority, the Phi Gamma, who have a house on South Grand avenue and the Theta Xi, with a house on South Grand avenue, the Iota Delta sorority, and a social club known as the Triple "S." There is a Senior Honorary society known as Cap and Gown. Fraternities, sororities and social clubs, like other student organizations are under the supervision of the faculty.

SCHOLARSHIPS AND PRIZES

HIGH SCHOOL HONOR SCHOLARSHIPS

In order to promote the attendance of students of ability and promise upon the several institutions of the University of Montana it is the declared policy of the State Board of Education to provide for the awarding of scholarships to be known as "High School Honor Scholarships" to graduates of the accredited public high schools of the state.

In the administration of this policy the number of scholarships awarded each year in any accredited high school will depend upon the number of graduates, as hereinafter specified. In no case, however, will more than two such scholarships be awarded each year in any high school for any one of the institutions of the University. High School Honor Scholarships may be awarded only to students who belong to the highest one-fourth of the graduating class in scholarship.

The following regulations will govern the awarding of High School Honor Scholarships:

1. Upon the presentation of the required certificate from the principal, the Chancellor of the University will authorize the award each year to graduates of each of the accredited public high schools of the state, High School Honor Scholarships for the component institutions of the University of Montana.

2. To be eligible for a High School Honor Scholarship the individual must be certified by the principal:

- (a) To be a graduate of an accredited high school of the state;
- (b) To belong to the highest one-fourth of his class in scholarship;
- (c) To be a student of ability and promise of success in college or professional school; and
- (d) To be the highest in scholarship of those members of the graduating class desiring to attend the university institution for which the honor scholarship is to be awarded.

2. No more than one honor scholarship may be awarded to the membership of any graduating class having seven or fewer graduates; no more than two scholarships may be awarded to the membership of any graduating class having eight to eleven graduates; no more than three scholarships may be awarded to the membership of any graduating class having twelve to fifteen graduates; no more than four scholarships may be awarded to the membership of any graduating class having sixteen or more graduates.

4. No more than two High School Honor Scholarships may be

awarded each year in any high school for any one of the institutions of the University.

5. The holders of High School Honor Scholarships shall be exempt from the payment of all customary fees except the student activity fees and the special fees in the Schools of Law and Music. All holders of High School Honor Scholarships will be expected to make the required course deposits.

6. Any High School Honor Scholarship will become void unless the holder enters one of the institutions of the University within eighteen months after graduation from the high school. The holder of a High School Honor Scholarship must give notice to the Registrar of the institution of his intention to utilize the scholarship, not later than September first of the year in which he intends to enter the institution.

7. Any High School Honor Scholarship will be valid only as long as the holder is in attendance upon some regular course leading to graduation; provided, however, that no High School Honor Scholarship shall be valid for a period longer than five years.

8. In case any individual to whom has been awarded a High School Honor Scholarship relinquishes the scholarship without entering the institution, or for any reason fails to enter the institution in compliance with Section 6 of the regulations, the high school principal may certify the next ranking eligible member of the same graduating class desiring to enter the particular institution.

9. The privileges of a High School Honor Scholarship may be retained only so long as the holder maintains a standard of scholarship and regularity of attendance satisfactory to the faculty of the institution at which he is in attendance.

RULES FOR AGRICULTURAL CLUB SCHOLARSHIPS

1. Upon notice from the State Leader of Boys' and Girls' Agricultural clubs of the awards of the annual club contests, the Chancellor will authorize the issuance of Agricultural Club Scholarships to the winners of first place in the corn, potato, garden, bread, garment-making, livestock, or other agricultural club contests in any county in Montana, and to winners of first, second and third places in the state agricultural club contest.

2. The Agricultural Club Scholarship shall be good in any one of the component institutions of the University of Montana which the holder may select, provided that in order to enter such institu-

tion, the holder must meet the entrance requirements in effect in such institution at the time the holder seeks to enter.

3. Holders of Agricultural Club Scholarships shall be exempted from the payment of all customary fees except the student activity fees and the special fees in the Schools of Music. They will, however, be expected to make the required course deposits.

4. Scholarships issued to winners of first place in county club contests shall be good for one year of attendance. Those issued to winners of third, second and first place in the state contest shall be good for two, three, and four years of attendance respectively.

5. Any Agricultural Club Scholarship will become void unless the holder enters one of the institutions of the University of Montana within eighteen months after the completion of his preparatory course. The holder must give notice to the registrar of the institution of his intention to utilize the scholarship, not later than September first of the year in which he intends to enter the institution, or immediately upon receipt of the scholarship.

6. Any Agricultural Club Scholarship will be valid only so long as the holder is in attendance upon some regular course leading to graduation, and maintains a standard of scholarship and regularity of attendance satisfactory to the faculty of the institution of the University of Montana at which he is in attendance.

MILITARY SERVICE SCHOLARSHIPS

Upon the proper certification of the president that a student has rendered military or naval service to the nation and has been honorably discharged, the Chancellor of the University of Montana will authorize the award of a Military Service Scholarship to such student. The holder of such scholarship, throughout their course, will be exempt from the payment of all regular fees, but not laboratory deposits or special course tutitions.

By special action of the State Board of Education the privileges of the Military Service Scholarship are extended to all students of the University of Montana who met the requirements for membership in the Students' Army Training Corps and actually took up work in one of the corps of the University of Montana, but were deprived of induction through the action of the war department cancelling all inductions which were not complete November 11, 1918.

MONTANA FEDERATION OF WOMEN'S CLUBS SCHOLARSHIPS

Upon the nomination of the officers of the Montana Federation of Women's clubs, the State Board of Education has authorized the

award of one scholarship each year in each of the institutions of the University. The holders of such scholarships are exempted from the payment of all customary fees, except the student activity fees and the special tuition fees in music. They are expected to make the required course deposits.

The Federation of Women's Clubs assumes the payment of expenses for board, room rent, necessary books, course deposits, student activity fee, and gymnasium suit.

Y. W. C. A. SCHOLARSHIP

Every four years the Y. W. C. A. offers a scholarship to a woman high school graduate who might otherwise be unable to attend college. Selection of a woman is made from among the applicants on the basis of character and scholarship. The woman elected is given her fees, books, and student activity ticket, and a good home is found where she may work for her room and board.

PRIZE IN ORATORY

An annual prize of twenty dollars is given to the winner of the annual local oratorical contest. This is open to all students. The winner represents the college in the state oratorical contest.

ARMSTRONG PRIZE IN DECLAMATION

Hon. F. K. Armstrong of Bozeman, gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary schools. There is also a second prize of five dollars. Only regular students are eligible.

STORY PRIZE IN EXTEMPORANEOUS SPEAKING

Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an extemporaneous speaking contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

STUDENT LOAN FUND

GENERAL UNIVERSITY STUDENT LOAN FUND

The Montana Banker's Association, and the Alumni of the University of Nebraska residing in Montana, have each established funds which are available for students in the junior and senior classes of any of the institutions of the University of Montana, who are unable to continue their studies without financial aid, and are satisfactorily recommended as to character and scholarship by the dean

or director, or the head of the department in which the applicant's major work is done. The loan to any one student is limited to two hundred dollars during his course, and not more than one hundred dollars in any one year. Loans must be repaid within one year from the time of borrowing, or in exceptional cases, one year after graduation. Loans bear two per cent interest.

Application blanks and a statement of detailed regulations governing these loans may be obtained from the registrar.

STATE COLLEGE ALUMNI FUND

The Montana State College Alumni Loan Fund is for the purpose of assisting worthy students and alumni who are in need of funds. Loans may be made to students of collegiate rank and alumni who have not been out of college more than two years.

Borrowers are required usually to bring letters of recommendation from two to three members of the faculty and to sign a promissory note. The notes bear 4 per cent interest during the life of the instrument and 6 per cent thereafter.

The Loan Fund Manager is usually a member of the staff of the Montana State College and has his office either on or near the campus.

ATHLETICS.

The gymnasium furnishes a convenient place for gymnasium practice, basketball, and other indoor athletics. There are dressing rooms for both men and women, shower and needle bath rooms, and a material room. On the campus are located a quarter mile cinder track, a baseball diamond, a football field, and three cement tennis courts.

ELIGIBILITY FOR ATHLETICS

The rules governing eligibility of players shall be the same for all athletic contests in which any team plays and officially scheduled contest under the name of the college, whether the game be with another college, a club, or a secondary school. Each student representing this institution in an intercollegiate contest must be eligible according to the Rocky Mountain Faculty Athletic Conference rules.

BASKETBALL TOURNAMENT, SPEAKING CONTEST, AND ESSAY CONTEST

The annual high school basketball tournament, speaking contest and essay contest are held on Wednesday, Thursday, Friday and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basketball teams, who have, during the basket-

ball season proven their superiority in competition with other teams. Appropriate school trophies are presented to the best teams, and suitable individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest, and an essay contest are held.

LIBRARY AND READING ROOMS.

MAIN LIBRARY

The library occupies the south half of the first floor of Montana Hall. It contains 19,305 volumes not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works in technology, history, science, and literature, as well as with dictionaries, cyclopedias and other reference works.

By Act of Congress the library is a depository and receives all public documents and other printed matter issued by the United States government.

DEPARTMENT LIBRARIES

The agricultural library occupies two rooms on the first floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One room on the first floor of the biology building is used for the library and periodicals of the biological department. A library and reading room is maintained by the College of Engineering.

Experiment Station

Associated with the State College is the Montana Agricultural Experiment Station. This Station was established by an Act of Congress, (Hatch Act), passed in 1887, and supplemented by another act, (Adams Act), passed in 1906.

In the words of these Congressional Acts, the purpose of these appropriations is as follows:

"It shall be the object and duty of said Experiment Stations to conduct original researches and verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under the varying series of crops; the capacity of new plants of trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative effects on crops of different kinds; the adoption and value of grasses and forage crops; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiment bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories."

These acts define and limit the work of the Agricultural Experiment Station. It must be directed towards the solving of the practical agricultural problems of the state and making that industry more profitable to those engaged in it.

The appropriations from the federal government have been supplemented by State appropriations.

The work covered by the Experiment Station is indicated by the ten departments of work, which are as follows:

Agronomy, Animal Husbandry, Poultry, Horticulture, Farm Management, Agricultural Engineering, Chemistry, Entomology, Botany and Bacteriology, and Veterinary.

The Experiment Station farm consists of about 260 acres of irrigated land adjoining the campus, and the Ft. Ellis farm of about 600 acres of non-irrigated land, some four miles out. Well equipped laboratories are also provided for the various departments, while all the farm buildings are arranged so as to facilitate the experiments

with live stock. The equipment and facilities of the Experiment Station are available to a limited number of students for graduate work.

The great variations in the climate of the state makes necessary the establishment of sub-stations to study the crop possibilities of various sections of the state. At present four such stations are in operation, viz: In the Judith Basin near Moccasin; in the Yellowstone Valley near Huntley; in Northern Montana, near Havre, and in the Bitter Root Valley near Corvallis. The last sub-station is for the study of fruit and garden crops only. While not covering all the climatic regions of the state these sub-stations afford opportunity for more complete study of the state's agricultural possibilities and particularly of the crops adapted to particular sections of the state.

The results of the studies and observations made by the station staff are published in bulletins, circulars, leaflets, posters, etc. They are distributed free of cost to the people of the state who apply for them. Those who would like to receive the publications as issued may have their names placed on the permanent mailing list and receive the bulletins as soon as issued. Write to the Agricultural Experiment Station, Bozeman, Montana.

Agricultural Extension Service

The co-operative extension work in agriculture and home economics had its official beginning in the passage by Congress of the Smith-Lever Act of May 8, 1914.

It has been organized as the last of the three principal divisions of the State College. All federal and state extension service in Montana in agriculture and home economics has been placed in charge of an extension director.

The field work is grouped into two classes according to the area covered as state and county service. The projects now under way are:

1. Agronomy.
2. Boys' and Girls' Club Work.
3. County Agent Work.
4. Extension Schools.
5. Dairy.
6. Farmers' Institutes.
7. Farm Management Demonstration.
8. Home Economics.
9. Live Stock.
10. Marketing.

Agronomy consists of instruction and demonstrations in field crops, crop rotation, seeds, and soil management.

Boys' and Girls' Club work consists of clubs for corn growing, potato-growing, gardening, pig, calf, colt, and lamb raising, canning, bread, and garment making.

County agents are in several counties, carrying on local projects in crop demonstrations, community meetings and organization, live stock, dairy, better seed, rodent and insect control, and such incidental problems in farming and country life as may arise.

Extension schools in agriculture and home economics are held in farming communities by special arrangement, three to five instructors being provided by the extension service, classes continuing for three to six days.

The dairy work has to do with better cows, and better breeding sires, cow-test associations, silos and forage crops, feeding, shelter, and co-operative dairying.

Farmers' institutes have been held to the number of from one hundred to several hundred each year for about twenty years in Mon-

tana. The plan is to hold one and two-day meetings, in the agricultural centers of each county, each year, with lecturers distinguished as successful practical farmers or as agricultural scientists, at each meeting.

Farm management demonstrations seek to increase good economic farm practices, and eliminate the uneconomic, by keeping farm accounts and records. These are summarized, analyzed and studied. The farmer with this knowledge is able to expand his operations in the right direction, and retrench where it is unprofitable.

Home economics demonstrations in ten counties conducted by trained women seek to improve home conditions, health, and satisfaction in country living.

The live stock project aims at the improvement in live stock, a reduction of stock losses, and a better distribution of farm animals.

The marketing activities keep farmers better informed regarding markets for farm products, promote direct dealing between producer and consumer, and stimulate the production by securing better markets and more profitable sales of farm products.

Organization for Instruction

A. The following four-years college courses, each leading to the degree of Bachelor of Science, are offered:

1.—COLLEGE OF AGRICULTURE.

- (a) Agronomy.
- (b) Animal Husbandry.
- (c) Dairy Husbandry.
- (d) Horticulture.

2.—COLLEGE OF ENGINEERING.

- (a) Architectural Engineering.
- (b) Chemical Engineering.
- (c) Civil Engineering.
- (d) Electrical Engineering.
- (e) Mechanical Engineering.

3.—COLLEGE OF APPLIED SCIENCE.

- (a) Botany and Bacteriology.
- (b) Chemistry.
- (c) Entomology and Zoology.

4.—COLLEGE OF HOUSEHOLD AND INDUSTRIAL ARTS.

- (a) Applied Art.
- (b) Home Economics.
- (c) Applied Science for Women.
- (d) Secretarial Work.

5.—COURSES IN VOCATIONAL EDUCATION FOR TEACHERS.

- (a) Agricultural Education and Extension Methods.
- (b) Home Economics Vocational Training.
- (c) Trades and Industry.

B. The following courses, not leading to a Bachelor's Degree, are offered:

- (a) School of Agriculture.
- (b) School of Mechanic Arts.
- (c) School of Home Economics.
- (d) Secretarial Work.
- (e) Course for Nurses.

College of Agriculture

This college includes four courses, Agronomy, Animal Husbandry, Dairy Husbandry, and Horticulture. For the first two years the work is the same in all courses.

The agricultural course is based on the assumption that the students are familiar with the manual operation of farm work. All students should have at least one year's farm experience before entering the course. In any case, students must furnish satisfactory evidence of having spent six months in practical work on a farm before graduation.

The college is very completely equipped for agricultural instruction. A large agricultural building, which centralizes the work, a one-thousand-acre farm, a large orchard and garden, large and well equipped laboratories for the studying of soil and crops, for milk testing and dairy manufacturing, and for the study of farm machinery, a large greenhouse well stocked with plants, and several barns and other buildings filled with various breeds of livestock, including beef and dairy cattle, horses, sheep, hogs and poultry—all these are at the command of the agricultural student.

COURSE IN AGRICULTURE

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1)	4	4	4
Trigonometry and Logarithms (Math. 8).....			4
or Elementary Analysis (Math. 16).....			
Livestock Judging (An. Husb. 1, 1a).....	4	3	
Poultry Management (Poult. 41).....	4		
History of Agriculture (Agron 12).....	2		
Agricultural Botany (Bot. 6).....		5	
Principles of Plant Production (Hort. 1, 1a).....		2	3
Farm Dairying (Dairy 1)			4
Military Science (Mil. Sci. 1).....	1	1	1
*Farm Practice.			

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Organic Chemistry (Chem. 5)	6		
Agricultural Chemistry (Chem. 7).....		6	
Invertebrate Zoology (Zool. 1).....	6		
Field Crops (Agron. 1).....	3	4	
Soil Physics (Agron. 2)			4
Fruit Growing and Gardening (Hort. 10).....		5	
Agricultural Physics (Phys. 1a).....			6
Veterinary Physiology and Anatomy (Vet. Sci. 51).....			
or Economic Entomology (Ento. 4).....			5
Military Science (Mil. Sci. 2).....	1	1	1

*The student's record must show that he has had at least six months' farm experience before graduation.

COURSE IN AGRONOMY

JUNIOR YEAR

	Autumn	Winter	Spring
Economics (Econ. 3)	3		
Dry Land Farming (Agron. 16)	3		
Bacteriology (Bact. 12)	6		
Agricultural Economics (Econ. 6)		3	
Soil Fertility (Agron. 3)		4	
Irrigation Water Supply (Agron. 13)		5	
Plant Physiology (Bot. 3)			6
Forage Crops (Agron 11)			5
Irrigation Institutions and Economics (Econ. 10)			3
Elective	6	6	4

SENIOR YEAR

Principles of Breeding (Agron. 7)	6		
Grain Marketing and Judging (Agron. 5)	3		
Farm Management (Agron. 6)		6	
Farm Records and Accounts (Agron. 10)			3
Farm Mechanics (Agron. 4)		5	
Soil Management (Agron. 8)			3
Irrigation Farming (Agron. 14)			5
Elective	9	7	7

Note—Students will be required to choose not less than five quarter credits from additional courses offered in the College of Agriculture, and not less than eight quarter credits from courses offered in the College of Applied Science.

COURSE IN ANIMAL HUSBANDRY

JUNIOR YEAR

	Autumn	Winter	Spring
Nutrition of Farm Animals (An. Husb. 4)	5		
Economics (Econ. 3)	3		
Agricultural Economics (Econ. 6)		3	
General Bacteriology (Bact. 12)	6		
Common Diseases (Vet. Sci. 57)		5	
Breeds of Live Stock (An. Husb. 2)		5	
Breeds of Live Stock (An. Husb. 2a)			4
Handling and Fitting Livestock (An. Husb. 11)			2
Forage Crops (Agron, 11)			5
Electives	4	5	7

SENIOR YEAR

Advanced Stock Judging (An. Husb. 3)	2		
Experimental Feeding (An. Husb. 9)	3		
Principles of Breeding (Agron. 7)	6		
Beef Cattle and Sheep Production (An. Husb. 7)		5	
Horse, Swine and Dairy Cattle Pro. (An. Husb. 8)			5
Breeding Farm Animals (An. Husb. 6)			4
Sanitary Science (Vet. Sci. 56)		3	
Obstetrics (Vet. Sci. 54)			3
Electives	7	10	6

Note—In the junior and senior years rules for electives are: Sixteen quarter credits required in the College of Agriculture and twelve quarter credits required in the College of Applied Science.

COURSE IN DAIRY HUSBANDRY

JUNIOR YEAR

	Autumn	Winter	Spring
Inspection of Milk Products (Dairy 2).....	3		
Advanced Judging and Extension (Dairy 9).....	3		
General Bacteriology (Bact. 12).....	6		
Economics (Econ 3).....	3		
Agricultural Economics (Econ. 6).....		3	
Market Milk (Dairy 5)		5	
Breeds of Livestock (An. Husb. 2).....		5	
Creamery Buttermaking (Dairy 3).....			5
Breeds of Livestock (An. Husb. 2a).....			4
Elective	3	5	9

SENIOR YEAR

Cheese Making (Dairy 4).....	5		
Milk Production (Dairy 7).....	4		
Dairy Management (Dairy 6)		3	
Sanitary Science (Vet. Sci. 56).....		3	
Factory Management (Dairy 8)			4
Dairy Technology (Dairy 10)			4
Elective	9	12	10

Note—Students will be required to choose not less than fifteen quarter credits offered in the College of Agriculture and not less than twenty-four quarter credits in the College of Applied Science.

COURSE IN HORTICULTURE

JUNIOR YEAR

	Autumn	Winter	Spring
Economics (Econ. 3)	3		
Agricultural Economics (Econ. 6)		3	
Systematic Pomology (Hort. 4)	5		
Soil Fertility (Agron. 3).....		4	
General Bacteriology (Bact. 12)	6		
Commercial Vegetable Gardening (Hort. 11).....		5	
Plant Physiology (Bot. 3).....			6
Forage Crops (Agron. 11)			5
Electives	4	6	7

SENIOR YEAR

Landscape Gardening (Hort. 6).....	4		
Principles of Breeding (Agron. 7).....	6		
Plant Pathology (Bot. 4)	6		
Greenhouse Construction and Management (Hort. 5)		4	
Farm Mechanics (Agron. 4)		5	
Commercial Fruit Growing (Hort. 7).....			5
Advanced Economic Entomology (Ento. 6).....		5	
Electives	2	4	13

Courses of Instruction

Note—Animal husbandry and dairy husbandry students will take Veterinary Anatomy and Physiology (Vet. Sci. 51), and agronomy and horticultural students will take Entomology (Ento. 4).

AGRONOMY

PROFESSORS, P. V. CARDON, F. B. LINFIELD, (Dean). ASSISTANT PROFESSORS, E. L. CURRIER, H. E. MURDOCK, L. F. GIESEKER, H. R. SUMNER.

The Agronomy course is designed to afford special training in practices of irrigation and dry land farming including; production of field crops, the cultivation of soils, the maintenance of soil fertility, the uses of machinery and power, and the management of farms. The aim in this work is to fit men to intelligently deal with the many problems arising in the development of western agriculture under dry land and irrigated conditions.

1. Field Crops. 2 Q. Autumn and Winter. 7 cr. Prerequisite Botany 1. Fee \$1; deposit \$1. Mr. Sumner.

History, characteristics, uses and methods of growing and marketing wheat, oats, barley, corn, flax, and other cereals; identification and judging of different varieties of grain. Lect. 2; lab. 1; lect. 2; lab. 2.

2. Soil Physics. 1 Q. Spring. 4 cr. Prerequisites Physics 1a, Chemistry 5. Fee \$1; deposit \$1. Mr. Gieseke and Mr. Sumner.

Soil and its cultivation in relation to growth of crops; origin, formation and classification of soil; study of the physical properties; influence of tillage, crop rotations and manure on soil moisture, structure, temperature and aeration. Lect. 3; lab. 1.

3. Soil Fertility. 1 Q. Winter. 4 cr. Prerequisites Chemistry 7. Bacteriology 12. Mr. Gieseke.

Maintenance of fertility; use of fertilizers and crop rotations and their influence on the productive capacity of the soil. Lect. 4.

4. Farm Mechanics. 1 Q. Winter. 5 cr. Prerequisite Physics 1a. Mr. Murdock.

Development, construction, functions and methods of operating,

adjusting and repairing implements, farm machinery, farm motors and tractors. Lect. 3; lab. 2.

5. **Grain Marketing and Judging.** 1 Q. Autumn. 3 cr. Prerequisite Agronomy 1, 11. Fee \$1. Mr. Sumner.

Study of cereal, grass and forage seeds with practice judging. Commercial grading of grain. Lab. 3.

6. **Farm Management.** 1 Q. Winter. 6 cr. Prerequisites Agronomy 1, 2. Mr. Currier.

In this course are taught the fundamental principles involved in the efficient organization and management of a farm business. Lect. 4; Lab. 2.

7. **Principles of Breeding.** 1 Q. Autumn. 6 cr. Prerequisite Zoology 1. Mr. Cardon.

Variation, biometry, heredity, selection mutations, hybridization, reversion and prepotency as applied to plants and animals; methods used in improvement of plants. Lect. 6.

8. **Soil Management.** 1 Q. Spring. 3 cr. Prerequisite Agronomy 1, 2. Mr. Gieseke.

Methods of handling alkali, gumbo, sandy, heavy clay, muck, peat and worn-out soils; soil problems of irrigated and dry farms. Lect. 3.

9. **Thesis.** 3 Q. Autumn, Winter and Spring. Continuous. 6 cr. Mr. Cardon.

Senior agronomy students may prepare a thesis on some subject approved by the head of the department not later than November 15.

10. **Farm Records and Accounts.** 1 Q. Spring. 3 cr. Mr. Currier.

Keeping and interpreting farm accounts. Open to juniors and seniors in the College of Agriculture. Lect. 1; lab. 2.

11. **Forage Crops.** 1 Q. Spring. 5 cr. Prerequisite Agronomy 1. Fee \$1; deposit \$1. Mr. Sumner.

History characteristics and methods of management of grasses, clovers and other crops where the entire plant is cut for hay or used for silage, pasturage or soiling. Lect. 3; lab. 2.

12. **History of Agriculture.** 1 Q. Autumn. 2 cr. Mr. Linfield. Lect. 2.

13. **Irrigation Water Supply.** 1 Q. Winter. 5 cr. Open to juniors and seniors in agriculture. Mr. Murdock.

Source of water supply; snow and rainfall; period of precipitation; runoff; storage; pumping for irrigation; measurement and dis-

tribution of water; losses of water; duty of water; excessive use of water; drainage; location of irrigating systems. Lect. 5.

14. Irrigation Farming. 1 Q. Spring. 5 cr. Open to juniors and seniors in agriculture. Mr. Murdock.

Irrigation compared with humid and dry land farming; relative cost; objects to be attained in irrigation; preparation of land for irrigation; leveler—its principles and use; running laterals and laying off farms for irrigation; uses of levels, methods of irrigation; effects of soils and crops on methods of irrigation, rate of applying water; duty of water on crops; prevention of waste; conditions affecting the formation of alkali bogs. Lect. 3; lab. 2.

15. Drainage. 1 Q. Spring. 3 cr. Open to juniors and seniors in agriculture. Mr. Murdock.

Physical relations and interrelations in soils; effect of water supply on crop growth; excessive moisture; seepage and its control; farm drainage systems; kinds of drains; laying out drainage systems; drainage for irrigated lands. Lect. 3.

16. Dry Land Farming. 1 Q. Autumn. 3 cr. Prerequisite Agronomy 2. Mr. Gieseke and Mr. Sumner.

A study of the problems related to dry land farming with particular reference to Montana and northwestern states. Climate; soil; moisture conservation; tillage methods; cropping systems; and water requirements of crops and their adaptability to dry land conditions. Lect. 2; lab. 1.

ANIMAL HUSBANDRY

PROFESSOR, ————. ASSISTANT PROFESSORS, R. C. McCHORD, W. E. JOSEPH. INSTRUCTOR, J. O. TRETSVEN.

The course in animal husbandry covers the various phases of live stock production, such as judging, selection, breeding, feeding, care and management for both farm and range conditions.

The aim is to give the student a thorough training in practical and scientific live stock production. The work in judging begins with score card practice and leads to judging groups. Feeding is based upon scientific principles and made as practicable as possible. Study of pedigrees and breeding records gives a knowledge of the most desirable families or strains within different breeds and points the way to live stock improvement.

This course aims to give a scientific and practical training that fits the student for work in practical and scientific stock farming,

also work in teaching and research work in animal husbandry in the various fields.

The department of animal husbandry in the college and experiment station maintains a number of the leading breeds of live stock for use in the class room. This equipment consists of several types of horses; Herford, Shorthorn, Holstein and Jersey cattle; Berkshire, Poland China, Duroc Jersey swine; Cotswold, Shropshire and Rambouillet sheep; and several of the leading breeds and types of poultry.

The experiment station also maintains a large number of high grade animals for experimental work that are available for study and offer many practical demonstrations in feeding and management.

The equipment of barn, silos, etc., is of modern plan and construction and affords an excellent opportunity for study.

1. Live Stock Judging. 1 Q. Autumn. 4 cr. Fee \$1. Mr. McChord.

Beef cattle and sheep. Scoring individuals, judging groups, study of live stock markets and market classifications. Lect. 1; lab. 3.

1a. Live Stock Judging. 1 Q. Winter. 3 cr. Fee \$1. Mr. McChord.

Horses, swine, and dairy cattle. Scoring individuals, judging groups, study of live stock markets and market classifications. Lab. 3.

2. Breeds of Live Stock. 1 Q. Winter. 5 cr. Prerequisite Animal Husbandry 1. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of beef cattle and sheep; judging breed type. Lect. 4; lab. 1.

2a. Breeds of Live Stock. 1 Q. Spring. 4 cr. Prerequisite Animal Husbandry 1a. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of horses, swine, and dairy cattle; judging breed type. Lect. 3; lab. 1.

3. Advanced Stock Judging. 1 Q. Autumn. 2 cr. Prerequisite Animal Husbandry 2, 2a. Fee \$1. Mr. McChord.

Continuation of judging and study of market and breeding stock. Beef cattle, sheep, horses, swine and dairy cattle. Lab. 2.

4. Nutrition of Farm Animals. 1 Q. Autumn. 5 cr. Prerequisite Chemistry 5. Mr. Joseph.

Digestion, metabolism, enzyme changes, functions of nutrients, compounding rations, feeding standards, feeds, their uses and adaptability in the ration. Lect. 5.

6. Breeding Farm Animals. 1 Q. Spring. 4 cr. Prerequisites Animal Husbandry 2, 2a, Agronomy 7. Fee \$1. Mr. McChord.

Principles and practices of breeding farm animals, tabulation and study of pedigrees. Lect. 3; lab. 1.

7. Beef Cattle and Sheep Production. 1 Q. Winter. 4 or 5 cr. Prerequisite Animal Husbandry 4. Mr. ———, Mr. McChord.

Feeding, care and management of pure bred and grade beef cattle and sheep. Lect. 4; lab. 1.

8. **Horses, Swine and Dairy Cattle Production.** 1 Q. Spring. 4 or 5 cr. Prerequisite Animal Husbandry 4. Mr. ———, Mr. McChord.

Feeding, care and management of pure bred and grade horses, swine and dairy cattle. Lect. 4. Lect. 4; lab. 1.

9. **Experimental Feeding.** 1 Q. Autumn. 3 cr. Prerequisites Animal Husbandry 4, 7. Mr. ———, Mr. Joseph.

Methods, principles and results of experimental work in animal husbandry. Lect. 2; lab. 1.

10. **Thesis.** 1 Q. Autumn, Winter or Spring. 3 cr. Mr. ———

Animal husbandry students may select thesis work during the senior year.

11. **Handling and Fitting Live Stock.** 1 Q. Spring. 2 cr. Fee \$2. Mr. McChord, Mr. Tretsvén.

Fitting and handling live stock for show, sale, breeding and work. Lab. 1.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

The course in dairy husbandry embraces both the productive and the manufacturing features of the dairy industry. The first two years are given largely to a study of the general and the agricultural sciences with a view of preparing the student for economic application to practical dairy problems.

The productive phase of the work includes the management of the dairy herd, handling of milk on the farm, transportation, distribution, inspection and marketing of milk. The manufacturing phase deals with the more technical work in separation, testing and preparation of dairy products, factory management, exhibiting judging and marketing.

The course is designed to fit the student for the rapidly growing demand for men trained in practical, modern dairy science. The positions open are financially attractive, and offer splendid opportunities for rapid advancement, especially as pertains to college, experiment station and educational lines. Of no less importance is the commercial side which deals with milk production, farm, factory, and corporation management; farm, factory, and municipal inspection; dairy manufactures and marketing.

1. **Farm Dairying.** 1 Q. Spring. 4 cr. Fee \$2; deposit \$1.

Development of the dairy industry, selection of the dairy farm, the cow, the sire, and building up the dairy herd. Secretion, com-

position, and testing of milk and cream. Care of milk on the farm, operation of hand separators, ripening cream, making butter and marketing dairy products. Lect. 3; lab. 1.

2. Inspection of Milk Products. 1 Q. Autumn. 3 cr. Prerequisites Dairy 1, Chemistry 2. Fee \$2; deposit \$1.

Methods of inspection, scoring stables, dairies, milk depots, factories and markets; composition of milk products in relation to standards of purity. Lect. 2; lab. 1.

3. Creamery Butter Making. 1 Q. Spring. 5 cr. Prerequisite Dairy 1.

Handling cream and making butter on a commercial scale, practice in pasteurizing; making starters; ripening cream, churning, packing and storage of butter. Lect. 3; lab. 2.

4. Cheese Making. 1 Q. Autumn. 5 cr.

Modern methods of making cheddar cheese adapted to farm and factory practice. Lect. 3; lab. 2.

5. Market Milk. 1 Q. Winter. 5 cr.

Relation of the milk supply to producer, distributor and consumer. Grading and pasteurizing, standardizing, certifying, modifying, bottling and distribution of milk. Lect. 4; lab. 1.

6. Dairy Management. 1 Q. Winter. 3 cr. Prerequisite Dairy 1.

Organization and management of different systems of dairy farms and study of factors in the cost of producing milk. Planning and equipping of barns, silos, stalls, milk rooms, and ice houses. Lect. 2; lab. 1.

7. Milk Production. 1 Q. Autumn. 4 cr. Prerequisite Dairy 1.

A study of the milk producing ability of dairy breeds, and of the factors influencing a persistent milk flow as breeding, feeding, and care of the herd. Lect. 3; lab. 1.

8. Factory Management. 1 Q. Spring. 4 cr. Prerequisites Dairy 3, 4.

Organization, location, planning construction and equipping of factories, handling by-products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Lect. 2; lab. 2.

9. Advanced Judging and Extension. 1 Q. Autumn. 3 cr. Prerequisites Dairy 1, Animal Husbandry 1a.

The advanced judging of dairy cattle which will require trips to dairy farms and other practice work. Handling exhibits of dairy cattle, organization of cooperative cow testing associations, breeding associations, calf clubs, and official registry of cows.

10. Dairy Technology. 1 Q. Spring. 4 cr.

Composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts. Lect. 3; lab. 1.

HORTICULTURE.

PROFESSOR, ————. ASSISTANT PROFESSOR, C. C. STARRING.

The four years' course in horticulture leading to the degree of Bachelor of Science in horticulture, is designed to prepare students as teachers in agricultural colleges, investigators in the agricultural experiment stations, editors of horticultural papers, managers of fruit associations and superintendents of commercial orchards and fruit plantations. The Western United States leads the world in methods of orcharding and disposing of orchard products and there is a strong and growing demand for persons properly trained to manage the orchard projects now operated throughout the fruit regions of the West. Fruit growing, when done in a scientific way is extremely profitable and presents an inviting field for the trained horticulturist. The college offers good facilities for a thorough training in all branches of horticulture.

1. **Principles of Plant Production.** 1 Q. Winter. 2 cr. Pre-requisite Botany 1. Fee \$1; deposit \$1. Mr. ————

Propagation of plants by grafting, budding and hardwood cuttings. Lect. 1; lab. 1.

1a. **Principles of Plant Production.** 1 Q. Spring. 3 cr. Pre-requisite Botany 1. Fee \$1; deposit \$1. Mr. ————

Propagation of plants from spores, seeds, cuttings, layers; methods of gathering and storing seeds; transplanting. Lect. 2. lab. 1.

4. **Systematic Pomology.** 1 Q. Autumn. 5 cr. Prerequisites Horticulture 1, Botany 1. Fee \$5. Mr. Starring.

Description and naming of varieties of fruit. Judging of exhibition fruit and discussion of score cards. Evolution of cultivated plants, especially fruits. Lect. 2; lab 3.

5. **Greenhouse Construction and Management.** 1 Q. Winter. 4 cr. Prerequisites Horticulture 1, Agronomy 2, 3. Mr. ————.

Construction, heating and maintaining of greenhouses; growing plants in greenhouses and conservatories. Lect. 4.

6. **Landscape Gardening.** 1 Q. Autumn. 4 cr. Fee \$1. Mr. Starring.

Laying out and planning of private and public grounds are discussed. Trees, shrubs, and flowers suited to Montana conditions are studied. Lect. 2; lab. 2.

7. **Commercial Fruit Growing.** 1 Q. Spring. 5 cr. Prerequisites Horticulture 1, 4, Agronomy 2, 3. Mr. ————.

Planting, cultivating, irrigating and managing commercial

orchards. Methods of picking, grading, packing, and marketing fruits. Lect. 4; lab. 1.

8. **Thesis.** Credits variable. Mr. ———.

Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture.

10. **Fruit Growing and Gardening.** 1 Q. Winter. 5 cr. Pre-requisite Horticulture 1. Mr. Whipple, Mr. Starring.

Principles of orcharding and gardening, with special reference to their bearing upon home orcharding and home gardening. Lect. 5.

11. **Commercial Vegetable Growing.** 1 Q. Winter. 5 cr. Pre-requisite Horticulture 1. Mr. Starring.

Organization and management of market and truck gardens; special problems connected with growing vegetables on a large scale. Preparation of vegetables for market; methods of marketing, storage of vegetables. Lect. 4; lab. 1.

POULTRY HUSBANDRY

PROFESSOR, W. F. SCHOPPE.

41. **Poultry Management.** 1 Q. Autumn. 4 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and brooding, preparation for and marketing of poultry products. Lect. 3. lab. 1.

42. **Poultry Breeds.** 1 Q. Autumn. 4 cr. to 6 cr.

Origin and development of the more important breeds of poultry, breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lect. 3; lab. 1 or 3.

43. **Incubation and Brooding.** 1 Q. Spring. 4 cr.

Operating incubators, testing eggs, keeping records, operating brooders, care and feeding of chicks. Lect. 2; lab. 2.

44. **Poultry Houses.** 1 Q. Autumn. 6 cr.

Planning, arranging, and designing poultry houses. Lect. 4; lab. 2.

45. **Poultry Feeds and Feeding.** 1 Q. Autumn. 4 cr.

Feeds suited to poultry, grain mixture, etc., feeding for egg production and fattening stock for market. Lect. 2; lab. 2.

46. **Marketing Poultry Products.** 1 Q. Autumn. 4 cr. Fee \$1.

Preparation of poultry and eggs for market, storage, preservation, principles of marketing, killing, picking, and packing poultry. Draw-

ing, boning and trussing fowels for special market. Candling, grading, and packing eggs. Lect. 3; lab. 1.

47. **Advanced Poultry Breeding.** 1 Q. Winter. 4 cr. Prerequisites Agronomy 7, Poultry 42.

Breeding birds for show purposes; judging birds, selection and mating of birds for fancy and utility purposes. Lect. 3; lab. 1.

48. **Poultry Culture.** 1 Q. Winter. 3 cr. Fee \$1.

Breeds of poultry, their care, housing and feeding. Preparation, grading and packing poultry for market. Methods of marketing. Cold storage poultry. Selection of poultry for the table, drawing, trussing and boning. Candling, grading, and packing eggs for market. Methods of marketing. Preserving eggs for future consumption, methods of storage and means of detecting storage eggs. Elective for junior and senior students in home economics. Lect. 2; lab. 1.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

51. **Veterinary Physiology and Anatomy.** 1 Q. Spring. 5 cr. Fee \$2.

Physiology of domestic animals, dealing with digestion and assimilation of foods, the circulation and functions of the blood, the nervous system and organs of special sense, and muscles and phenomena of locomotion. Lect. 4; lab. 1.

53. **Pathology.** 1 Q. Winter or spring. 3 cr. Prerequisite Veterinary Science 51.

Study of normal and pathological tissues. Gross and microscopical specimens will be used for demonstration. Lect. 1; lab. 2.

54. **Obstetrics.** 1 Q. Spring. 3 cr. Prerequisite Veterinary Science 51.

Diseases of domestic animals incident to reproduction. Normal parturition, dystokia, and care of the newborn; illustrated by clinic cases. Lect. 2.

56. **Sanitary Science.** 1 Q. Winter. 3 cr. Prerequisite Veterinary Science 57 or Bacteriology 12.

Care and handling of farm animals affected with contagious and infectious diseases. Methods of diagnosis, treatment, quarantine and general preventative measures. Lect. 2.

57. **Common Diseases of Animals.** 1 Q. Winter. 5 cr. Prerequisite Veterinary Science 51 or Bacteriology 12.

Diagnosis and first aid treatment of the more common ailments of live stock. Farm sanitation and general measures for disease prevention. Illustrated by clinic cases. Lect. 5.

College of Engineering

The rapid development of the State of Montana makes the profession of engineering one of great importance. The development of our natural resources requires the services of engineers with specialized training. At no time has there been so great a demand for engineers as now, and the indications are that this demand will continue for years to come. The College of Engineering has grown rapidly during the past few years.

All engineering courses supported by the state, except the course in mining engineering at the School of Mines at Butte, are concentrated in the State College at Bozeman. As a result of this concentration of effort, the best possible instruction is provided by the State.

COURSE IN ARCHITECTURAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1).....	4	4	6
Engineering Mathematics (Math. 1, 2, 3).....	5	5	5
Engineering Drawing (E. D. 1, 2, 3).....	3	3	3
Carpentry (M. E. 2).....	2		
Architectural Drawing (Art. 3).....		2	2
Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Engineering Mathematics (Math. 4, 5, 5a).....	4	4	4
Engineering Physics (Phys. 1).....	3	3	3
Physical Measurements (Phys. 2).....	2	2	2
Architectural Drawing (Art 3a).....	3	3	
Building Sanitation (A. E. 5).....	3		
Theoretical Mechanics (C. E. 5).....		3	3
Elementary Design (A. E. 4).....			3
Military Science (Mil. Sci. 2).....	1	1	1

JUNIOR YEAR

Economics (Econ. 3).....	3	3	
Mechanics of Materials (C. E. 6).....	5		
Strength of Materials (C. E. 8).....		1	
Graphic Statics (C. E. 28).....	5		
History of Architecture (A. E. 2, 3).....	4	2	3
Working Drawings (A. E. 1).....	3		
Roofs and Bridges (C. E. 29).....		4	
Masonry Construction (A. E. 14).....		4	
Specifications and Working Drawing (A. E. 6).....		4	
Engineering Economics (C. E. 45).....			3
Hydraulics (C. E. 43).....			2
Estimating (A. E. 8).....			3
Specifications and Working Drawings (A. E. 7).....			3
Electives.....			4

SENIOR YEAR

Illumination (E. E. 19).....	3		
Bridge Design (C. E. 30).....	5		
Architectural Engineering (A. E. 15).....	4		
Decoration (A. E. 10).....	3		
Architecturl Engineering (A. E. 16).....		4	
Electric Power (E. E. 14).....		3	
Heat Engines (M. E. 7).....		3	
Steel Mill Buildings (A. E. 11).....		3	
Cement Laboratory (C. E. 34).....		2	
Heating and Ventilation (M. E. 24).....			2
Contracts and Specifications (C. E. 23).....			2
Concrete Design (C. E. 32).....			4
Foundations and Masonry (C. E. 21).....			3
Thesis (A. E. 12).....			4
Electives.....	3	3	3

COURSE IN CHEMICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1).....	4	4	6
Engineering Mathematics (Math. 1, 2, 3).....	5	5	5
Engineering Drawing (Eng. Dr. 1, 2, 3).....	3	3	3
Shop Work (M. E. 2, 9).....	2	2	
Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Engineering Mathematics (Math. 4, 5, 5a).....	4	4	4
Engineering Physics (Phys. 1).....	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Qualitative Analysis (Chem. 2).....	5		
Quantitative Analysis (Chem. 3).....		5	5
Seminar (Chem. 20)	1	1	1
Military Science (Mil. Sci.).....	1	1	1

JUNIOR YEAR

Economics (Econ. 3).....	3	3	
Physical Chemistry (Chem. 19)		5	5
Organic Chemistry (Chem. 9)	5	5	5
Mechanism (M. E. 8, 8a).....	4	1	
Engineering Chemistry (Chem. 12).....			4
Quantitative Analysis (Chem. 4)	4		
Theoretical Mechanics (C. E. 5).....		3	3
Seminar (Chem. 20)	1	1	1

SENIOR YEAR

Advanced English Composition (Eng. 3).....	2	2	2
Industrial Chemistry (Chem. 14)	5	5	5
Seminar (Chem. 20)	1	1	1
Electro Chemistry (Chem. 23)	5		
Electric Power (E. E. 14, 14a).....		3	4
Advanced Heat (Phys. 16)	4		
Fuel and Oil Analysis (Chem. 17)		3	
Water Analysis (Chem. 18)			4
Foundry (M. E. 4).....		2	
Mechanical Laboratory (M. E. 15a).....		2	
Elective			2

COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1)	4	4	4
Engineering Mathematics (Math. 1, 2, 3).....	5	5	5
Engineering Drawing (E. D. 1, 2, 3).....	3	3	3
Land Surveying (C. E. 1).....	2		2
Carpentry (M. E. 2).....		2	
Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Engineering Mathematics (Math. 4, 5, 5a).....	4	4	4
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Plane Surveying (C. E. 2).....	4		
Topographical Mapping (E. D. 4).....		3	
Railroad Engineering (C. E. 4).....			3
Highway Engineering (C. E. 47).....	2		
Theoretical Mechanics (C. E. 5).....		3	3
Military Science (Mil. Sci. 2).....	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Mechanics of Materials (C. E. 6)	5		
Hydraulics (C. E. 37)		4	
Engineering Economics (C. E. 45)			3
Graphic Statics (C. E. 28)	3		
Strength of Materials (C. E. 8).....		1	
Railroad Economics (C. E. 9).....	4		
Engineering Chemistry (Chem. 12)	3		
Roofs and Bridges (C. E. 29).....		4	
Hydraulic Engineering (C. E. 15).....		2	4
Geology (Geol. 1)		4	
Astronomy (Math. 6)			3
Least Squares (Math. 12)			3
Highway Engineering (C. E. 7)			4
Hydraulic Laboratory (C. E. 38)			1

SENIOR YEAR

Irrigation Engineering (C. E. 36)	3		
Bridge Design (C. E. 30)	5		
Municipal Engineering (C. E. 3)	3		
Geodesy (C. E. 17)	3		
Sanitary Engineering (C. E. 14)		4	
Bridges and Dams (C. E. 31)		3	
Electric Power (E. E. 14)		3	
Cement Laboratory (C. E. 34).....		2	
Highway Engineering (C. E. 35).....		3	
Concrete Design (C. E. 32)			4
Foundations and Masonry (C. E. 21)			3
Contracts and Specifications (C. E. 23).....			2
Seminar (C. E. 12)			1
Thesis (C. E. 27)			4
Electives	4	3	4

COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
Engineering Mathematics (Math. 1, 2, 3).....	5	5	5
General Chemistry (Chem. 1)	4	4	4
Engineering Drawing (E. D. 1, 2, 3).....	3	3	3
Shop Work (M. E. 2, 6, 9).....	2	2	2
Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Engineering Mathematics (Math. 4, 5, 5a).....	4	4	4
Theoretical Mechanics (C. E. 5).....		3	3
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Electrical Machinery (E. E. 1).....	2		
Electrical Diagrams (E. E. 7).....	2	1	1
Machine Work (M. E. 21)			2
Surveying (C. E. 1a).....	2	2	
Military Science (Mil. Sci. 2).....	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Engineering Economics (C. E. 45)			3
Mechanics of Materials (C. E. 6)	5		
Electricity and Magnetism (Phys. 5).....	3	3	
Direct Currents (E. E. 3);	3	3	4
Dynamo Design (E. E. 8)	1	2	3
Electrical Laboratory (E. E. 4).....	1	1	2
Heat Engines (M. E. 7)		3	
Hydraulics (C. E. 48)			3
Mechanical Laboratory (M. E. 15a).....		2	
Seminar (E. E. 17)	1	1	1
Strength of Materials (C. E. 8).....	1		
Elective			2

SENIOR YEAR

Alternating Currents (E. E. 9)	4	4	4
Electrical Design (E. E. 13).....	3	3	3
Electrical Laboratory (E. E. 10).....	3	3	2
Seminar (E. E. 17)	1	1	1
Thesis (E. E. 20)	1	3	4
Contracts and Specifications (C. E. 23).....			2
Engineering of Power Plants (M. E. 26a).....	3		
Elective	3	4	2

COURSE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
Engineering Mathematics (Math. 1, 2, 3,).....	5	5	5
General Chemistry (Chem. 1)	4	4	4
Engineering Drawing (Eng. Dr. 1, 2, 3).....	3	3	3
Shop Work (M. E. 2, 6, 9).....	2	2	2
Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Engineering Mathematics (Math. 4, 5, 5a).....	4	4	4
Engineering Physics (Phys. 1).....	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Mechanism (M. E. 8)	3		
Theoretical Mechanics (C. E. 5).....		3	3
Kinematic Drawing (M. E. 8a).....	1	1	1
Shop Work (M. E. 2a, 4, 21).....	2	2	2
Military Science (Mil. Sci. 2).....	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Engineering Economics (C. E. 45)			3
Mechanics of Materials (C. E. 6)	5		
Strength of Materials (C. E. 8)		1	
Valve Gears (M. E. 10).....	2		
Electric Power (E. E. 14, 14a).....		3	4
Machine Elements (M. E. 13).....		3	3
Steam Engines and Boilers (M. E. 17).....	4		
Thermodynamics (M. E. 18)		4	4
Mechanical Laboratory (M. E. 15, 20).....	2	2	2
Machine Work (M. E. 27)	2	2	2

SENIOR YEAR

Gas Power Engineering (M. E. 22).....	4		
Mechanical Engineering of Power Plants(M.E. 26).....		4	
Heating and Ventilation (M. E. 24).....			2
Contracts and Specifications (C. E. 23).....			2
Machine Design (M. E. 23)	3	3	3
Manufacturing Methods and Machinery(M. E. 31)	3		
Mechanical Laboratory (M. E. 28).....	2		
Hydraulics (C. E. 37)		4	
Hydraulic Laboratory (C. E. 38).....			1
Industrial Organization and Management(M.E.25).....			3
Seminar (M. E. 11)	1	1	1
Thesis (M. E. 30)	2	2	2
Elective	3	4	4

Courses of Instruction

ARCHITECTURAL ENGINEERING

PROFESSOR, W. R. PLEW.

The rapid increase in population in the State of Montana will result in a healthy growth of our cities and towns. Homes, factories, office buildings and public buildings will be erected.

In addition to the science which are common to all engineering courses, this course includes a thorough study of freehand drawing and the drawing of architectural designs. Ancient and modern architecture is studied in all its phases in order that the student may become acquainted with the proper architectural forms. The construction of steel and concrete buildings, the sanitation of buildings, interior and exterior decoration, and illumination, form an important part of the instruction given.

The course is intended to provide the training which the student will need to prepare himself for work as an architectural engineer, building superintendent, contractor or builder

1. Working Drawings. 1 Q. Autumn. 3 cr. Fee \$1.

Detailing on a large scale, floors, windows, stairs, cornice, cabinet making and conventional methods in architectural drawing. Lab. 3.

2. History of Architecture. 2. Q. Autumn. 4 cr. Winter 2 cr.

History of architectural design from early Egyptian to Renaissance, illustrated by lantern slides. Lect, 2; lab. 1.

3. History of Architecture. 1 Q. Spring. 3 cr.

A continuation of the above, with special reference to modern times. Lect. 2; lab. 1.

4. Elementary Design. 1 Q. Spring. 3 cr. Fee \$1.

Rendering of the orders and sketch problems involving simple composition. Lab. 3.

5. Building Sanitation. 1 Q. Autumn. 3 cr.

Design and installation of plumbing; removal of waste, sewage

disposal, water supply and fixtures in dwellings and public buildings.
Lect. 3.

6. **Specifications and Working Drawings.** 1 Q. Winter. 4 cr.
Plan and framing problems; ballon framing, detailing of walls,
etc. Lab. 4.

7. **Specifications and Working Drawings.** 1 Q. Spring. 3 cr.
Masonry details, stereotomy, and building specifications. **Lect. 3.**

8. **Estimating.** 1 Q. Spring. 3 cr.
Estimating building costs. **Lect. 3.**

10. **Architectural Decoration.** 1 Q. Autumn. 3 cr. Fee \$1.
Interior and exterior ornamental design and finish of buildings.
Lab. 3.

11. **Steel Mill Building.** 1 Q. Winter. 3 cr. Prerequisites
Civil Engineering, 28, 29. Fee \$1.

Designs of trusses in framed bents; arches; mill building construction, slow burning and fire proof construction, specifications.
Lab. 3.

12. **Thesis.** 1 Q. Spring. 4 cr.

13. **House Planning.** 1 Q. Spring. 2 cr.
For students in home economics. **Lab. 2.**

14. **Masonry Construction.** 1 Q. Winter. 4 cr. Fee \$1.

The study of building stones and their preparation for use in the wall. Design of masonry construction with special reference to its use in building construction. Stereotomy. **Lect. 3; lab. 1.**

15. **Architectural Engineering.** 1 Q. Autumn. 4 cr. Prerequisites Civil Engineering 6, 29, concurrently with Civil Engineering 30. Fee \$1.

Design of steel framework in modern building construction.
Lab. 4.

16. **Architectural Engineering.** 1 Q. Winter. 4 cr. Prerequisite Architectural Engineering 15. Fee \$1.

Design of larger buildings, methods of construction fireproofing.
Lab. 4.

CHEMICAL ENGINEERING

PROFESSOR, W. M. COBLEIGH. ASSISTANT PROFESSORS, E. J. QUINN, W. D. HATFIELD. INSTRUCTORS, E. R. NORRIS, L. C. HUMPHREY. ASSISTANT, R. M. PICKENS. SPECIAL LECTURER, W. H. ANDREWS, Chief Chemist, Three Forks Portland Cement Company—Clays and Cement Making Materials.

The courses of instruction that constitute the four years course in Chemical Engineering are chosen to train men to take a leading part in the development and operation of those industries and manufacturing pursuits which are based on the applications of chemistry.

The work of this course can be classified in three groups: First, courses which provide a thorough knowledge of the principles of general, analytical, physical, organic and industrial chemistry; second, those courses which provide a knowledge of mathematics, physics and engineering including both mechanical and electrical engineering subjects; third, courses which give the student training in chemical engineering proper. In these courses, the principles of chemistry and of engineering are applied to industrial operations.

Inspection trips are made to the various industrial plants in the state. The studies carried on at these plants are carefully systematized in order to give the student an opportunity to observe the application of the principles of chemical engineering.

1. **General Chemistry.** 3 Q. Autumn, Winter and Spring. Continuous. 12 to 14 cr. Fee \$5; deposit \$3. Mr. Cobleigh, Mr. Hatfield, Mr. Norris, Mr. Humphrey, Mr. Pickens.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds and elementary qualitative analysis. Lect. 2; lab. 2.

The class is taught in sections:

Section 1. For students who present high school units in chemistry for entrance.

Section 2. For students who have not had high school chemistry.

2. **Qualitative Analysis.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Quinn.

3. **Quantitative Analysis.** 3 Q. Autumn, winter and spring. Continuous. 12 or 15 cr. Prerequisite Chemistry 1 or 2. Fee \$4; deposit \$4. Mr. Quinn.

Theory and technique of the methods of analytical chemistry and chemical calculations. Lect. 2; lab. 2. Lect. 2; lab. 3.

4. **Quantitative Analysis.** 3 Q. Autumn, winter and spring.

Continuous. 12 or 15 cr. Prerequisite Chemistry 3, 5. Fee \$4; deposit \$4.

A continuation of chemistry 3. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 2. Lect. 2; lab. 3.

9. **Organic Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisite Chemistry 1 and 2. Fee \$4; deposit \$4. Mr. Hatfield.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

12. **Engineering Chemistry.** 1 Q. Autumn or spring. 3 or 4 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel and copper. Qualitative and approximate quantitative examination of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 1, or lect 2, lab. 2.

14. **Industrial Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisite Chemistry 2, 3, 9. Fee \$4; deposit \$4. Mr. Cobleigh.

The application of chemistry to the industries, including operations common to many chemical industries such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. The laboratory work in the spring quarter is taught from the viewpoint of chemical engineering. Lect. 3; lab. 2.

17. **Fuel and Oil.** 1 Q. Winter or spring. 3 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Production and analysis of solid, liquid and gaseous fuels, illuminating gas and lubricating oils. Lect. 1; lab. 2.

18. **Water Analysis.** 1 Q. Winter or spring. 4 cr. Prerequisite Chemistry 1, 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemical examination of potable waters, or water for industrial purposes and steam raising, of sewage and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. **Physical Chemistry.** 2 Q. Winter and spring. 10 cr. Prerequisite Chemistry 3 and Mathematics 5 or 16. Fee \$4; deposit \$4. Mr. Hatfield.

Theoretical chemistry, including stoichiometry, radio-activity, the electron theory, the gas laws, osmotic pressure, theory of solution and the phase rule. Lect. 3; lab. 2.

20. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hatfield.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors, where the topics are discussed. Lect. 1.

21. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hatfield.

Students in the chemistry course may in the senior year, prepare a thesis on some subject which will involve considerable work and originality. Lab. 2.

22. **Technical Lectures.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hatfield.

Serves the purpose of so-called orientation lectures designed to give the freshman in chemistry or chemical engineering an appreciation of the field of chemistry in practical affairs, and to give him a more adequate outlook on the training required by professional chemists.

23. **Electro Chemistry.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 19. Fee \$2; deposit \$2. Mr. Hatfield.

Including the following topics:

Electrical conductance, equilibrium, hydrolysis, electro-motive force, electrolysis, polarization, electro analysis, electro plating, electric furnaces, applied electro chemistry. Lect. 3; lab. 2.

CIVIL ENGINEERING

PROFESSORS, L. D. CONKLING, W. R. PLEW. INSTRUCTOR, E. L. GRANT.

The civil engineering course is arranged to give a broad training in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems, they are taught the underlying principles of engineering and inspired with a desire to do their best work. The students study many problems connected with the location and construction of railroads, public highways, bridges, water works, water power development, irrigation, sewage systems, and sewage disposal, city and municipal engineering.

The freshman year is devoted to fundamental studies which give

both general culture and preparation for the technical work of the following years.

In the sophomore year the fundamental subjects of mathematics, English, physics, and chemistry are completed, and the technical subjects of civil engineering are begun. The theory of land surveying is taught by lectures, field work and drawing room exercises. The study of the theory and principles of highway and railroad engineering is begun.

The junior year completes the work in theoretical and applied mechanics and railroad engineering. The technical subjects of hydraulic engineering, structures and bridges, theory and design, are begun. The course in economics begun in the autumn quarter of the junior year is continued for three quarters, and consists of the study of such subjects as land, capital, labor, coinage, banking, interest, wages, taxation, etc. The important economic questions of the present time are considered and discussed.

The senior year is devoted to municipal and sanitary engineering, plain and reinforced concrete construction, the design of typical bridges and buildings, with complete working drawings, bill of materials and estimate of cost.

Students in civil engineering who desire to specialize in irrigation may substitute the irrigation subjects listed from civil engineering 36 to civil engineering 42 in place of some of the civil engineering work as tabulated on page 68.

Irrigation students will elect work in the College of Agriculture.

1. Land Surveying. 2 Q. Autumn and spring. 4 cr. Prerequisite Mathematics 2. Fee \$1; deposit \$2. Mr. Grant.

Theory, adjustment and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping. Lab. 2.

1a. Surveying. 2 Q. Winter and spring. Prerequisite Mathematics 2. Fee \$1; deposit \$2. Mr. Grant.

Theory, adjustment, and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping, draughting and office work. Lab. 2.

2. Plane Surveying. 1 Q. Autumn. 4 cr. Prerequisites Mathematics 2, Civil Engineering 1. Fee \$1; deposit 2. Mr. Grant.

Computation of areas, dividing of land, the methods of field, hydrographic, mine, and city surveying, barometric and spirit leveling, computation of earth work; map drawing and topographic signs; field work with transit level, and plane table; map drawing from students' field notes. Lab. 4.

3. Municipal Engineering. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 2. Mr. Conkling.

City planning, allotting and platting additions; construction of

streets, sidewalks, curbs, gutters, and parkings; disposal of refuse; city parks and their paths, walks and roadways; law affecting the work of the city engineer. Lect. 3.

4. Railroad Engineering. 1 Q. Spring. 3 cr. Prerequisite Civil Engineering 2. Fee \$1; deposit \$2. Mr. Conkling.

Railroad reconnaissance, preliminary and location surveys. Railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts, and crossings. Lab. 3.

5. Theoretical Mechanics. 2 Q. Winter and spring. 6 cr. Prerequisite Mathematics 4. Mr. Grant.

Forces and force systems, center of gravity and centroids, stress, principles of equilibrium, rectilinear, and curvilinear motion, work and energy, impulse, momentum and vectors. Lect. 3.

6. Mechanics of Materials. 1 Q. Autumn. 5 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

Elasticity and strength of timber, brick, stone, and metals. Theory of beams, columns, and shafts. Lect. 5.

6a. Applied Mechanics. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

A short course in the study of the elasticity and strength of the building materials, and the theory of simple beams and short columns. For students in trades and industry. Lect. 3.

7. Highway Engineering. 1 Q. Spring. 4 cr. Prerequisites Civil Engineering 2, 4. Mr. Conkling.

Preliminary investigations; surveying, mapping and design; grading, drainage, and foundations; natural and hard surfaced roads; pavements, etc. Lect. 2; lab. 2.

8. Strength of Materials. 1 Q. Autumn or winter. 1 cr. Prerequisite Civil Engineering 6. Fee \$2; deposit \$2. Mr. Conkling.

Experimental determinations of the strength of the several moduli of the more important of the materials of engineering. Lab. 1.

9. Railroad Economics. 1 Q. Autumn. 4 cr. Prerequisite Civil Engineering 4. Fee \$1; deposit \$2. Mr. Conkling.

Making of profiles, field maps, cross-sections, etc., from students' notes of the field work. Economics of railroad location; arrangement of yards, terminals, and stations. Making location map. Construction of the roadbed. Maintenance of way and the elements of railroad operation. Lect. 1; lab. 3.

12. Seminar. 1 Q. Spring. 1 cr. Mr. Conkling.

Members of the senior class meet to discuss the articles that appear in certain assigned engineering periodicals. Lect. 1.

14. Sanitary Engineering. 1 Q. Winter. 4 cr. Prerequisite Civil Engineering 1, 3, 15. Mr. Conkling.

Methods of sewage treatment and disposal. The design of a sewage system and a disposal plant; house drainage; specifications and estimate of cost. Lect. 3; lab. 1.

15. Hydraulic Engineering. 2 Q. Winter and spring. 6 cr. Prerequisites Civil Engineering 37, 38. Mr. Conkling.

Precipitation, drainage area, runoff, storage, public water supplies, reservoirs, pipe lines, pumping plants, purification plants, power development, etc. Lect. 2; lab. 1.

17. Geodesy. 1 Q. Autumn. 3 cr. Prerequisites Mathematics 6, Civil Engineering 1, 2, 4. Mr. Grant.

Base line measurements, triangulation balancing surveys and distributing errors, application of the method of least squares, principles of map projection. Determination of azimuth, latitude and longitude, the true north by sun and star observations. Lab. 3.

21. Foundations and Masonry. 1 Q. Spring. 3 cr. Prerequisites Civil Engineering 6, 28. Mr. Conkling.

Materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; specifications and costs. Lect. 2; lab. 1.

23. Contracts and Specifications. 1 Q. Spring. 2 cr. Mr. Conkling.

Correct form of specifications and judicial interpretation placed on technical terms commonly used in engineering specifications. Elective to all engineering students after the sophomore year. Lect. 2.

27. Thesis. 1 Q. Spring. 4 cr. Mr. Conkling.

The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. Subject must be chosen at the beginning of the senior year.

28. Graphic Statics. 1 Q. Autumn. 3 cr. Prerequisites Physics 1, 2, Civil Engineering 5. Fee \$1; deposit \$2. Mr. Plew.

Stresses in roof trusses by the force polygon. Application of equilibrium polygon to beams and girders. Stresses in bridge trusses, retaining walls and masonry arches. Lab. 3.

29. Roofs and Bridges. 1 Q. Winter. 4 cr. Prerequisites Civil Engineering 6, 28. Mr. Plew.

Theory and computation of stress in roof and bridge trusses under dead, live, and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Lect. 2; lab. 2.

30. Bridge Design. 1 Q. Autumn. 5 cr. Prerequisites Civil Engineering 6, 29. Fee \$1; deposit \$2. Mr. Plew.

Designing of girders and trusses; computations and complete drawings for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of materials and estimate of cost. Lect. 1; drawing 4.

31. Bridge and Dams. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 30. Mr. Plew.

Higher structures, including continuous draw, cantilever, and suspension bridges; theory and design of masonry walls, and dams other than the gravity section. Lect. 3.

32. Concrete Design. 1 Q. Spring. 4 cr. Prerequisites Civil Engineering 6, 30. Fee \$1; deposit \$2. Mr. Plew.

Design of reinforced concrete beams and slabs, reinforced concrete buildings and other structures. A complete design of a reinforced concrete arch by the Elastic Theory. Specifications and costs. Lect. 2; lab. 2.

34. Cement Laboratory. 1 Q. Winter. 2 cr. Prerequisite Civil Engineering 6. Fee \$2; deposit \$2. Mr. Conkling.

Manufacture and properties of hydraulic cement, proportioning and mixing concrete. Standard tests of sand and cement. Test of concrete beams, etc. Lab. 2.

35. Highway Engineering. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 7. Mr. Conkling.

Roads and pavements, contracts and specifications; methods of financing; organization and administration; legislation and state laws. Lect. 2; lab. 1.

36. Irrigation Engineering. 1 Q. Autumn. 3 cr. Prerequisite C. E. 37. Mr. Conkling.

History of irrigation; the principles of irrigation and location of irrigation system. Lect. 4.

37. Hydraulics. 1 Q. Winter. 4 cr. Prerequisites Mathematics 1, 2, 4, Physics 1, 2. Mr. Grant.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Lect. 4.

38. Hydraulic Laboratory. 1 Q. Spring. 1 cr. Prerequisite Civil Engineering 37. Fee \$2; deposit \$2. Mr. Grant.

Flow of water over weirs, through nozzles and pipes, open channels and conduits, etc. Lab. 1.

39. Canal Surveying. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 1. Fee \$1; deposit \$2. Mr. Grant.

Theory and practice of canal surveying, computation of earth work, field location of canals and ditches for irrigation. Lect. 1; field work 2.

40. Irrigation Engineering. 1 Q. Spring. 3 cr. Prerequisites Civil Engineering 36, 37, 38. Mr. Conkling.

Manner of supplying, storing, conveying and distributing irrigation water; management of irrigation systems; irrigation laws. Lect. 3.

41. Canal Management. 1 Q. Spring. 3 cr. Prerequisite Civil Engineering 40. Mr. Conkling.

Canal management, seepage and drainage. Lect. 3.

42. Pumping for Irrigation. 1 Q. Spring. 3 cr. Prerequisites Civil Engineering 37, 38, Mechanical Engineering 15a. Mr. Conkling.

Small rotary and reciprocating pumps. Steam, gas and oil engines used for pumping. Electric motor driven pumps. Lect. 3.

43. Elementary Hydraulics. 1 Q. Spring. 2 cr. Prerequisites Mathematics 1, 2, 4, Physics 1, 2. Mr. Conkling.

Elementary course in theoretical hydraulics for students in architectural engineering. Course given each alternate year beginning February 1920.

44. Concrete Construction. 2 Q. Winter and spring. 6 cr. Prerequisite Civil Engineering 6a. Fee \$2; deposit \$2. Mr. Conkling.

A study of cement and cement products; their manufacture, storage, etc. The effects of impurities, proportioning and mixing aggregates, upon the strength and life of concrete. The design and methods of construction of simple concrete structures, such as floors, walks, flumes, troughs, small culverts, small cisterns, etc. Lect. 1; lab. 2.

45. Engineering Economics. 1 Q. Spring. 3 cr. Prerequisite Economics 3. Mr. Grant.

A study of economic questions of interest to engineers and others engaged in the industries, including methods of valuation of public utilities, commerce commission reports, determination of most economic machines, annuities, interest, perpetuities, present worth, etc.

46. Topographical Mapping. 1 Q. Winter. 5 cr. Fee \$1; deposit \$1. Mr. Grant.

Study of the different methods of map projection, such as plane, polyconic, bonnes, and mercators. Use of instruments and methods of topographical plotting. Map reading. Methods of using topographical maps in obtaining data of practical value to army, hydro-electric, railroad, highway, and irrigation engineers. Lect. 2; lab. 3.

47. Highway Engineering. 1 Q. Autumn. 2 cr. Mr. Conkling.

Roads and paving materials. Their inspection and laboratory tests. Lect. 1; lab. 1.

48. Hydraulic Engineering. 1 Q. Spring. 3 cr. Mr. Grant.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Fundamental theory of water wheels and water power development. For electrical engineering students. Lect. 3.

ELECTRICAL ENGINEERING

PROFESSOR, J. A. THALER. ASSISTANT PROFESSOR, R. D. SLOAN.

The course in electrical engineering is designed to give a thorough technical training in which theoretical subjects and the application of theory to the solution of practical problems are emphasized.

The general training consists of courses in English, mathematics, physics, chemistry, drawing and shop work. The technical work covers the theory and application of electrical phenomena, and the designing and testing of electrical machines and apparatus.

The equipment of the electrical laboratory is very complete, with apparatus of modern type, as well as machines of historical value. The laboratories contain various types of direct and alternating current dynamos and motors, storage batteries, an oscillograph, a 150,000 volt transformer, a wireless station, and other equipment.

1. **Electrical Machinery.** 1 Q. Autumn. 2 cr. Mr. Thaler.

Construction, care and operation of commercial electrical machines and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers, and electrical measuring instruments. Lect. 2.

3. **Direct Currents.** 3 Q. Autumn, winter and spring. 10 cr. Prerequisites Physics 1, Mathematics 4. Mr. Sloan.

Principles of electro-magnetism, theory of dynamo electric machines, design, construction and regulation of direct current machines. Lect. 3, 3, and 4.

4. **Electrical Laboratory.** 3 Q. Autumn, winter and spring. 4 cr. Prerequisite Physics 2. Fee \$1; deposit \$5. Mr. Sloan.

Determination of armature and field resistance; magnetic leakage, efficiency and regulation of various types of direct current machines. Lab. 1, 1, and 2.

7. **Electrical Diagrams.** 3 Q. Autumn, winter and spring. Continuous. 4 cr. Mr. Sloan.

Conventional methods of representing electrical wiring and appliances. National Electrical Code. Diagrams of D. C. Switchboards and electric light wiring. General and detail drawing of dynamos. Lab. 2, 1 and 1.

8. **Dynamo Design.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite Electrical Engineering 7. Mr. Sloan.

Designing electro-magnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Lab. 1, 2, and 3.

9. **Alternating Currents.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite Physics 5. Mr. Thaler.

Theory of alternating currents, properties of alternating current

circuits, principles of alternators, transformers, rotary converters and induction motors. Lect. 4.

10. Electrical Laboratory. 3 Q. Autumn, winter and spring. Continuous. 8 cr. Prerequisite Physics 5. Fee \$1; deposit \$5. Mr. Thaler.

Tests of alternating current generators, motors and transformers, calibration of alternating current measuring instruments. Lab. 3, 3 and 2.

13. Electrical Design. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Thaler, Mr. Sloan.

Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking electrical engineering. Lab. 3.

14. Electrical Power. 1 Q. Winter. 3 cr. Mr. Sloan.

Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Lect. 3.

14a. Electrical Power. 1 Q. Spring. 4 cr. Prerequisite Electrical Engineering 14. Fee \$1; deposit \$5. Mr. Sloan.

Industrial applications of electricity. Electrical equipment of power stations and substations. Efficiency and regulation tests of batteries, transformers, direct and alternating current generators and motors. Lect. 3; lab. 1.

15. Radio Telegraphy. 3 Q. Autumn, winter and spring. Continuous. Credits variable. Mr. Thaler.

Theory and practice of radio telegraphy, code instruction, practice in adjusting and operating field sets. Lect. 1; lab. 2.

17. Seminar. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Thaler.

Weekly meetings for the purpose of discussing current electrical engineering literature. Lect. 1.

18. Special Design. Credits variable. Mr. Thaler.

Design and construction of some special electrical apparatus or machine. Elective for seniors.

19. Illumination. 1 Q. Autumn. 3 cr. Mr. Sloan.

Sources of light, laws of photometry and measurement of light, calculation of illumination, electric light wiring, underwriters' rules and symbols of the National Contractors' Association. Lect. 3.

20. Thesis. 3 Q. Autumn, winter and spring. Continuous. 8 cr. Mr. Thaler.

Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. The subject for the thesis must be chosen at the beginning of the senior year.

MECHANICAL ENGINEERING

PROFESSOR, EARLE B. NORRIS, (Dean.) ASSISTANT PROFESSOR, R. T. CHALLENGER, ERIC THERKELSEN. INSTRUCTORS, F. C. HOMANN, F. W. KATELY, ALFRED LUDWIG.

The course in mechanical engineering aims to furnish fundamental training in the design, construction, testing and operation of power and manufacturing machinery, and in the management of manufacturing operations and enterprises. Closely correlated instruction and training by text book, lecture, laboratory and shop practice acquaint the student both theoretically and practically with the forces which he must control, with the qualities and values of the materials of engineering, and with the practical and economic considerations which govern design and construction. One of the prime considerations is to develop original thinking and conceptions based on solid scientific and practical lines. In addition to the technical instruction, the student is familiarized with the present day industrial problems and with the modern business methods in industrial organization. The course is planned to give a general training for the broad field of the mechanical engineer by a thorough grounding in the fundamentals rather than intense specialization, but some opportunity for specialization in a chosen line, or for broader cultural studies, is offered by electives in the senior year.

2. Carpentry. 1 Q. Autumn, winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Challenger.

Bench work in wood. Use and care of carpenters' tools. Elementary pattern work. Lab. 2.

2a. Pattern Work. 1 Q. Autumn. 2 cr. Prerequisite M. E. 2. Fee \$2; deposit \$2. Mr. Challenger.

Allowances for draft, shrinkage and finish; construction of patterns of machine parts, with necessary core-boxes. Lab. 2.

4. Foundry Work. 1 Q. Winter. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Floor and bench moulding; core making; cupola charging; pouring casting of gray iron, brass and other alloys. Lab. 2.

4a. Advanced Foundry Work. 1 Q. Winter. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Advanced moulding and core work; cupola management; foundry equipment and arrangement. In this course the student is expected to take charge of the cupola in running a heat. Lab. 2.

6. Wood Work. 1 Q. Autumn, winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Challenger.

Wood working machinery, wood turning. Lab. 2.

7. Heat Engines. 1 Q. Winter. 3 cr. Prerequisite Math. 4, Physics 1, 2. Mr. Therkelsen.

Steam boiler types; boiler construction; combustion of fuels; furnace efficiency; types of steam engines; engine economics; internal combustion engines. Lect. 3.

8. Mechanism. 1 Q. Autumn. 3 cr. Prerequisite E. D. 1, Math. 2. Mr. Therkelsen

Relative motions of machine parts; linkwork; belting; cams; systems of gear teeth; spur, bevel, helical and worm gears; gear trains; planetary gearing. Lect. 3.

8a. Kinematic Drawing. 3 Q. Autumn, winter and spring. 3 cr. Taken with M. E. 8. Mr. Therkelsen.

Drafting room problems in the laying out of different types of mechanisms to perform given functions. Lab. 1.

9. Forging. 1 Q. Autumn, winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Care of the fire; practice in forging, including drawing, bending, upsetting, and pointing of iron and steel; welding of mild steel and iron; working of tool steel. Lab. 2.

10. Valve Gears. 1 Q. Autumn. 2 cr. Prerequisite M. E. 8. Taken with M. E. 17. Mr. Therkelsen

The simple slide valve; valve diagrams; valve setting; reversing motions; riding cut-off; Corliss and poppet valve mechanisms. Lect. 1; lab. 1.

11. Seminar. 3 Q. Autumn, winter and spring. 3 cr. Mr. Norris.

Weekly meetings for the presentation and discussion of papers upon assigned topics pertaining to mechanical engineering. Lect. 1.

13. Machine Elements. 2 Q. Winter and spring. 6 cr. Prerequisite M. E. 8, C. E. 5 and 6. Mr. Norris

The application of the laws of mechanics and strength of materials to the design of machine elements and fastenings, systems of power transmission, journals, and simple machines. Lect. 1; lab. 2.

15. Mechanical Laboratory. 1 Q. Autumn. 2 cr. Taken with M. E. 17. Fee \$2. Mr. Therkelsen.

Calibration of instruments; calorimetry; indicator practice; fuel and lubricant tests; determination of power and mechanical efficiency of engines. Lab. 2.

15a. Mechanical Laboratory. 1 Q. Winter. 2 cr. Taken with M. E. 7. Fee \$2. Mr. Therkelsen.

Calibration of instruments; indicator practice; determination of power and mechanical efficiency of engines. Lab. 2.

17. Steam Engines and Boilers. 1 Q. Autumn. 4 cr. Mr. Therkelsen.

Types of boilers; boiler construction; properties of steam; boiler rating; boiler settings; combustion of fuels; feed waters; boiler accessories; types of steam engines; multi-expansion engines; condensing; Corliss, poppet valve and uni-flow engines; steam turbines. Lect. 4.

18. Thermodynamics. 2 Q. Winter and spring. 8 cr. Prerequisite M. E. 17, Physics 1. Mr. Therkelsen.

Properties of gasses, saturated and superheated vapors and mixtures; theoretical and actual engine cycles; flow of liquids through nozzles; throttling processes; applications to study of actual engine economics. Lect. 4.

20. Mechanical Laboratory. 2 Q. Winter and spring. 4 cr. Prerequisite M. E. 15. Fee \$2. Mr. Therkelsen.

Exercises in valve setting; tests of injectors, pumps and engines; thermal and mechanical efficiency tests of gasoline and oil engines. Lab. 2.

21. Machine Work. 1 Q. Spring. 2 cr. Fee \$2; deposit \$2. Mr. Homann.

Bench work in chipping, filing, and fitting. Simple machine work on lathe, drill press, planer and shaper. Lab. 2.

22. Gas Power Engineering. 1 Q. Autumn. 4 cr. Mr. Therkelsen.

Gas engine cycles; fuel mixtures; details of construction; performance of gas motors; design practice in stationary and automobile motors; gas producers and other gas machinery. Lect. 4.

22a. Gas Power. 1 Q. 4 cr. Prerequisite M. E. 7 or 18. Fee \$2. Mr. Therkelsen.

A brief discussion of the internal combustion engine cycles; followed by study of commercial types of engines and auxiliaries. Methods of testing and current practice in rating internal combustion engines. Laboratory tests of several types. Lect. 3; lab. 1.

23. Machine Design. 3 Q. Autumn, winter and spring. 9 cr. Prerequisites M. E. 13 and 18. Mr. Norris.

The application of principles of preceding courses to the design of complete machines. Assigned problems on machine tools, steam engines, gas engines and steam turbines. Lect. 1; lab. 2.

24. Heating and Ventilation. 1 Q. Spring. 2 cr. Prerequisite M. E. 7 or 17. Mr. Therkelsen.

Calculation of heat losses from buildings. Radiation require-

ments for steam, vapor, and hot water systems. Furnace systems. Ventilation with calculations for specific systems. Specifications and estimates of costs. Lect. 2.

25. Industrial Organization and Management. 1 Q. Spring. 3 cr. Mr. Norris.

Economics of factory location; staff and departmental organization; production planning and control; inspection systems; cost systems; modern wage systems; employment and labor problems; profit-sharing plans; co-operative-management systems. Lect. 3.

26. Mechanical Engineering of Power Plants. 1 Q. Winter. 4 cr. Prerequisite M. E. 7 or 18. Mr. Therkelsen.

A study of modern mechanical equipment of steam and gas power plants; costs and economics; selection of types and sizes; arrangements of plants; piping systems; fuel and ash handling; principles underlying design of complete plants; specifications.

26a. Engineering of Power Plants. 1 Q. Autumn. 3 cr. Prerequisite M. E. 7. Mr. Therkelsen.

A modification of course 26 with special emphasis on equipment for electric power plants. Lect. 3.

27. Machine Tool Work. 3 Q. Autumn, winter and spring. 6 cr. Prerequisite M. E. 21. Fee \$2; deposit \$2. Mr. Homann.

Work on lathe, planer, shaper, milling machine, grinder; manufacture of small tools, fitting of parts; autogenous welding; assembly of complete machines. Lab. 2.

28. Mechanical Laboratory. 1 Q. Autumn. 2 cr. Prerequisites M. E. 15 and 18. Fee \$2. Mr. Therkelsen.

Efficiency tests of steam and gas power plant machinery; refrigeration, compressed air and heating and ventilating equipment. Lab. 2.

30. Thesis. 3 Q. Autumn, winter and spring. 6 cr.

Before graduation, the student is required to present an accepted thesis involving an investigation of some problem related to mechanical engineering. Work will be done under the supervision of the head of the department, but the student will devise his own methods.

31. Manufacturing Methods and Machinery. 1 Q. Autumn. 3 cr. Mr. Norris.

The basic materials of engineering; production of steels; non-ferrous alloys; founding; forging methods and machinery; hot and

cold press work; extrusion; machining; machine tools; prevention of corrosion. Lect. 3.

32. **Automobile Practice.** 1 Q. Spring. 3 cr. Fee \$2. Mr. Homann.

Engines; carburetors; clutches and transmissions; axle types; ignition, starting, and lighting systems. Lect. 1; lab. 2.

ENGINEERING DRAWING.

1. **Mechanical Drawing.** 1 Q. Autumn. 3 cr. Mr. Ludwig.

Use of instruments; lettering; principles of orthographic projection; arrangement of views; drawings of machine parts; dimensioning; titles, sections. Lab. 3.

2. **Descriptive Geometry.** 1 Q. Winter. 3 cr. Mr. Ludwig.

Projections of points, lines, surfaces, and solids; intersections and developments; tangents to curves and surfaces; warped surfaces; shades and shadows; perspective. Lect. 1; lab. 2.

3. **Engineering Drawing.** 1 Q. Spring. 3 cr. Mr. Ludwig.

Commercial drafting, practice in different branches of engineering; symbols and conventions; assembly views; detailing; patent drawing; tracing and blue printing. Lect. 1; lab. 2.

4. **Topographical Mapping.** 1 Q. Winter. 3 cr. Prerequisites Civil Engineering 1 and 2. Fee \$1; deposit 1. Mr. Grant.

Map lettering and study of conventional signs for topographic maps. Plotting topographic map from stadia field notes. Use of planimeter. Map reading. Lect. 1; lab. 2.

5. **Graphic Presentation of Statistics.** 1 Q. Spring. 3 cr. Mr. Ludwig.

Lettering; charts and diagrams; presentation of statistics by charts, graphs; and pictorial methods. Lab. 3.

College of Applied Science

The departments comprised in the College of Applied Science have a two-fold duty to perform.

(1) They give instruction and training in the fundamental sciences as applied in agriculture, engineering, and home economics. A large and important part of the students' work in these major divisions of the institution is given in the science departments.

(2) They also offer several courses of instruction in which the main object is to prepare specialists in the various branches of the basic sciences. These courses also give an excellent general training and may be taken by those students of agriculture, engineering, and home economics, who desire to give more attention to the fundamental and less to the more specialized branches of agriculture, engineering and home economics.

The courses of instruction in the College of Applied Science, each leading to the degree of Bachelor of Science, are as follows: 1, Botany and Bacteriology; 2, Chemistry; 3, Entomology and Zoology.

Recognizing that beginning students will be benefitted by an opportunity to spend at least one year in the institution before committing themselves to a line of study to be followed, the work in the freshman year has been made much alike in courses 1, 2 and 3. During his first year the student takes up a considerable variety of studies and often learns for which line of work he is best adapted. At the opening of the sophomore year he can change courses within the same group without loss of time. Again, the freshman year in the agricultural course, listed elsewhere in the catalogue, is so much like the freshman year in the first three courses that usually a change in either direction can be made without inconvenience.

COURSE IN BOTANY AND BACTERIOLOGY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
Elementary Analysis (Math. 16).....	4	4	4
General Chemistry (Chem. 1)	4	4	4
General Botany (Bot. 1).....	5		
Agricultural Botany (Bot. 6)		5	
Systematic Botany (Bot. 2)			5
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Invertebrate Zoology (Zool 1).....	6		
Human Physiology (Zool. 3)		6	
Economic Entomology (Ent. 4).....			5
General Bacteriology (Bact. 12).....	6		
Sanitary Bacteriology (Bact. 13)		3	
Microbiology (Bact. 14)			5
General Physics (Phys. 14).....		5	5
Elective	3		
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Advanced English Composition (Eng. 3).....	2	2	2
Organic Chemistry (Chem. 9)	5	5	5
Embryology (Zool. 8)		5	
Plant Pathology (Bot. 4)		6	
Plant Physiology (Bot. 3)			6
Elective	10		4

SENIOR YEAR.

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Psychology (Ed. 1).....	3		
Geology (Geol. 1)		4	
Mycology (Bot. 5).....			5
Organic Evolution (Zool. 9)			4
Thesis (Bot. 11)	5	5	5
Elective	6	6	

COURSE IN CHEMISTRY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1)	4	4	6
Technical Lectures (Chem. 22)	1	1	1
Elementary Analysis (Math. 16) or Engineering Mathematics (Math. 1, 2, 3)	4-5	4-5	4-5
Electives	4	4	4
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Qualitative Analysis (Chem. 2)	5		
Quantitative Analysis (Chem. 3)		5	5
General Physics (Phys. 14) and		5	5
Invertebrate Zoology (Zool. 1) or	6		
Engineering Mathematics (Math. 4, 5, 5a) or	4	4	4
Engineering Physics (Physics 1, 2)	5	5	5
Electives	4	4	4
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Quantitative Analysis (Chem. 4)	4		
Physical Chemistry (Chem. 19)		5	5
Organic Chemistry (Chem. 9)	5	5	5
General Bacteriology (Bact. 12)	6		
Engineering Chemistry (Chem. 12)			4
Electives		5	4

SENIOR YEAR.

Advanced English Composition (Eng. 3)	2	2	2
Water Analysis (Chem. 18)			4
Electro Chemistry (Chem. 23)	5		
Seminar (Chem. 20)	1	1	1
OPTION I			
Industrial Chemistry (Chem. 14)	5	5	5
Fuel and Oil Analysis (Chem. 17)		3	
Elective	5	7	6
OPTION II			
Elective	10	14	12

COURSE IN ENTOMOLOGY AND ZOOLOGY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
Elementary Analysis (Math. 16)	4	4	4
General Chemistry (Chem. 1).....	4	4	4
General Botany (Bot. 1)	5		
Agricultural Botany (Bot. 6)		5	
Systematic Botany (Bot. 2)			5
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Organic Chemistry (Chem. 9).....	5	5	5
Invertebrate Zoology (Zool. 1)	6		
Human Physiology (Phys. 3).....		6	
Economic Entomology (Ent. 4)			5
General Physics (Phys. 14)		5	5
Elective	4		
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Advanced English Composition (Eng. 3)	2	2	2
General and Systematic Entomology (Ento. 5).....	5		
Adv. Economic Entomology (Ento. 6)		5	
Organic Evolution (Zool. 9)			4
General Bacteriology (Bact. 12).....	6		
Embryology (Zool. 8)		5	
Elective	5	6	12

SENIOR YEAR.

Economics (Econ. 3)	3	3	
Thesis (Ento. 10)	3-5	3-5	3-5
Advanced Entomology (Ento. 7)	2	2	2
Electives	8-10	8-10	11-13

A reading knowledge of at least one foreign language is recommended for candidates who expect to make professional use of entomology.

Courses of Instruction

BOTANY AND BACTERIOLOGY.

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

Botany and bacteriology are among the sciences most fundamental to agriculture. Through botany we learn of the different kinds of plants, and of the fungus parasites responsible for many plant diseases. Through bacteriology, we learn of plant and animal diseases and of important chemical changes brought about by micro-organisms in soil, dairy products, silage and other kinds of organic matter. While botany and bacteriology have other aspects besides those relative to agriculture the latter are especially emphasized here.

The four-years course leading to a degree in botany and bacteriology has two major purposes aside from its disciplinary value. First to train men for professional career in botany, plant pathology, agricultural bacteriology and related subjects; second to prepare students for the study of medicine in other institutions. With a judicious selection of electives this is a very good pre-medical course.

Every effort is made to maintain in this course the high standard found in similar courses of undergraduate work in the larger universities. A number of the best students get the additional opportunity of working in the laboratories of the experiment station where, in addition to making part of their expenses, they can become familiar with the methods used in research work in this department.

This course is characterized by a liberal amount of work in the other sciences, especially chemistry, and enough elective space for courses in applied agriculture, language, etc.

1. General Botany. 1 Q. Autumn. 5 cr. Fee \$2; deposit \$2 Mr. Swingle, Mr. Jennison.

Survey of the entire plant kingdom and under each group of plants is discussed the structure, physiology, evolution, life history and economic significance of representative examples. Lect. 3; lab. 3.

2. Systematic Botany. 1 Q. Spring. 5 cr. Prerequisite one course in elementary botany. Fee \$3. Mr. Swingle, Mr. Jennison.

Principles and methods used in classification, especially those

that apply to seed plants. Lectures, demonstrations, field and laboratory work to familiarize the student with Montana flora, including weeds that have been introduced from other regions. Lect. 4; lab. 6.

3. Plant Physiology. 1 Q. Spring. 6 cr. Prerequisites Botany 1 or 6, Physics 1a, Chemistry 5. Fee \$3; deposit \$3. Mr. Jennison.

Nutrition, growth, reproduction and movement in plants especially the higher forms. Lect. 3; lab. 3.

4. Plant Pathology. 1 Q. Winter. 6 cr. Prerequisites Botany 1 or 6, Bacteriology 12. Fee \$3. Mr. Jennison.

Plant disease, including the relations of host and parasites, methods of control and the nature of diseases not caused by parasites. Lect. 3; lab. 3.

5. Mycology. 1 Q. Spring. 5 cr. Prerequisite Botany 1. Fee \$3. Mr. Jennison.

A comparative study of the structure, physiology and classification of fungi. Lect. 2; lab. 3.

6. Agricultural Botany. 1 Q. Winter. 5 cr. Fee \$4; deposit \$2. Mr. Swingle, Mr. Jennison.

A brief study of the lower forms of plant life followed by a detailed study of the structure, physiology, and classification of seed plants, especially those of economic importance. Lect. 3; lab. 2.

11. Thesis. Credits variable. Fee \$1; deposit \$4. Mr. Swingle, Mr. Jennison.

Open to seniors in the botany and bacteriology course, and to others who have had sufficient preparation.

12. General Bacteriology. 1 Q. Autumn. 6 cr. Prerequisites Chemistry 1, one course in Botany or Zoology. Fee \$4; deposit \$3. Mr. Swingle, Mr. Jennison.

Structure, physiology and classification of bacteria, their growth in nutrient media and methods of bacteriology technique. Relation of bacteria to agriculture, to human and animal pathology, to the arts and industries. Lect. 3; lab. 3.

13. Sanitary Bacteriology. 1 Q. Winter. 3 cr. Prerequisite Bacteriology 12. Mr. Swingle.

Treating of infectious diseases. Sources and modes of infection for self protection and the protection of others. Lect. 3.

14. Microbiology of Waters and Foods. 1 Q. Spring. 5 cr. Prerequisite Bacteriology 12. Fee \$4; deposit \$4. Mr. Swingle, Mr. Jennison.

A study of micro-organisms in relation to the sanitary qualities

of waters and foods. Foods will be studied on even years and waters on odd years. Lect. 2; lab. 3.

15. **Elementary Bacteriology.** 1 Q. Spring. 5 cr. Fee \$3; deposit \$2. Mr. Swingle, Mr. Jennison.

Beginning nurses course. Microscopical and cultural studies of organisms; laboratory tests for diagnosis; bacteria in relation to infectious diseases. Lect. 2; lab. 3.

CHEMISTRY.

PROFESSOR, W. M. COBLEIGH. ASSISTANT PROFESSORS, E. J. QUINN, W. D. HATFIELD. INSTRUCTORS, E. R. NORRIS, L. C. HUMPHREY. ASSISTANT, R. M. PICKENS. Special Lecturers, E. BURKE, Chief Chemist Experiment Station, Agricultural Chemistry; M. J. BLISH, Research Chemist, Experiment Station, Protein Chemistry; W. H. ANDREWS, Chief Chemist, Three Forks Portland Cement Company—Clays and Cement Making Materials.

The application of chemistry to the various phases of agriculture, to home economics, to engineering and to many modern industries make this science an important one in a technical school.

A four years course in chemical engineering is offered by the division of engineering.

The chemistry course offered by the division of science has four options as outlined below. In this course, a large number of electives are offered each year, in order that the student may adapt his training to one of the following special fields. The student must elect one of the following options:

a. **Agricultural Chemistry.** Electives should be chosen from the various sub-courses in agriculture, biology, chemistry, and language. This will give the student an excellent training in scientific agriculture and prepares for positions in agricultural colleges and experiment stations, and the government service.

b. **Food Chemistry.** Electives should be chosen from home economics, biology, chemistry, and language.

c. **Biochemistry.** Elective should be taken mainly from biology, chemistry and language. This course prepares students for positions in state and municipal food laboratories, in water purification works and in sewage disposal plants.

d. **Industrial Chemistry.** In this option the electives should be chosen from sub-courses in mathematics, physics, and engineering.

This course prepares students for positions as chemists in the laboratories of the manufacturing industries.

1. **General Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 12 or 14 credits. Fee \$5; deposit \$3. Mr. Cobleigh, Mr. Hatfield, Mr. Norris, Mr. Humphrey, Mr. Pickens.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds; and elementary qualitative analysis. Lect. 2; lab. 2.

This class is taught in sections:

Section 1. For students who present high school units in chemistry for entrance.

Section 2. For students who have not had high school chemistry.

2. **Qualitative Analysis.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Quinn.

The course is presented from the standpoint of modern theories of chemistry. Lect. 3; lab. 2.

3. **Quantitative Analysis.** 3 Q. Autumn, winter and spring. Continuous. 12 or 15 cr. Prerequisite Chemistry 1 or 2. Fee \$4; deposit \$4. Mr. Quinn.

Theory and technique of the methods of analytical chemistry and chemical calculations. Lect. 2; lab 3; Lect. 2; lab. 3.

4. **Quantitative Analysis.** 3 Q. Autumn, winter and spring. Continuous. 12 or 15 cr. Prerequisite Chemistry 3, 5. Fee \$4; deposit \$4.

A continuation of Chemistry 3. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 2. Lect. 2; lab. 3.

5. **Agricultural Organic Chemistry.** 1 Q. Autumn. 6 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Hatfield.

Compounds of the aliphatic and aromatic series and organic materials of interest to students of agriculture and home economics. Lect. 4; lab. 2.

7. **Agricultural Chemistry.** 1 Q. Winter. 6 cr. Prerequisite Chemistry 5. Fee \$6; deposit \$4. Mr. Quinn.

Composition and reaction of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of feeding stuffs and of dairy products and problems of farm sanitation. Lect 4; lab. 2.

8. **Food Chemistry.** 1 Q. Spring. 6 cr. Prerequisite Chemistry 5. Fee \$4; deposit \$4. Mr. Hatfield.

Composition of foods, food production and preservation, food legislation and inspection. Lect. 4; lab. 2.

9. **Organic Chemistry.** 3 Q. Autumn, winter and spring. Con-

tinuous. 15 cr. Prerequisite Chemistry 1 and 2. Fee \$4; deposit \$4. Mr. Hatfield.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

11. **Physiological Chemistry.** 1 Q. Winter. 5 cr. Prerequisite Chemistry 5. Fee \$4; deposit \$4. Mr. Hatfield.

Functions of fats, carbohydrates, protein, and salts in nutrition, together with a study of the chemistry of digestion and metabolism. Lect. 3; lab. 2.

12. **Engineering Chemistry.** 1 Q. Autumn or spring. 3 or 4 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel, and copper. Qualitative and approximate quantitative examination of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 1, or lect. 2, lab. 2.

14. **Industrial Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 2, 3, 9. Fee \$4; deposit \$4. Mr. Cobleigh.

The application of chemistry to the industries, including operations common to many chemical industries, such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. The laboratory work in the spring quarter is taught from the viewpoint of chemical engineering. Lect. 3; lab. 2.

17. **Fuel and Oil Analysis.** 1 Q. Winter or spring. 3 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Production and analysis of solid, liquid, and gaseous fuels, illuminating gas and lubricating oils. Lect. 1; lab. 2.

18. **Water Analysis.** 1 Q. Winter or spring. 4 cr. Prerequisite Chemistry 1, 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewage and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. **Physical Chemistry.** 2 Q. Winter and spring. 10 cr. Prerequisite Chemistry 3 and Mathematics 5 or 16. Fee \$4; deposit \$4. Mr. Hatfield.

Theoretical chemistry, including stoichiometry, radio-activity, the electron theory, the gas laws, kinetic theory of gases, liquids, solids, colloids, osmotic pressure, theory of solution and the phase rule. Lect. 3; lab. 2.

20. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hatfield

Each student will be required to make abstracts of articles on

assigned subjects from the leading journals, and present them at weekly meetings of the students and department instructors, where the topics are discussed Lect. 1.

21. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr. Quinn, Mr Hatfield.

Students in the chemistry course may, in the senior year, prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab. 2.

22. **Technical Lectures.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Hatfield.

Serves the purpose of so-called orientation lectures designed to give the freshman in chemistry or chemical engineering, an appreciation of the field of chemistry in practical affairs, and to give him a more adequate outlook on the training required by professional chemists.

23. **Electro Chemistry.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 19. Fee \$2; deposit \$2. Mr. Hatfield.

Including the following topics:

Electrical conductance, equilibrium, hydrolysis, electromotive force, electrolysis, polarization, electro analysis, electro plating, electric furnaces, applied electro chemistry

ENTOMOLOGY AND ZOOLOGY.

PROFESSOR, R. A. COOLEY. ASSISTANT PROFESSOR, M. H. SPAULDING.

Taken as a whole the courses in this department are primarily designed to give training in the zoological branches as they are applied in horticulture, agronomy, animal husbandry, general agriculture, and home economics. They form a basis for an understanding of the various phases of the development of life and the problems of evolution. They throw light on the problems of social science, and are well designed for purposes of general education.

The department is well equipped with the necessary microscopes, microtomes, photographic apparatus and dark rooms and miscellaneous equipment, which permit all courses listed to be given in a thorough manner.

The various animal groups are well represented in the collections. In the museum room are about five hundred skins of mammals and birds, while among the study materials is an unusually full series of marine and fresh water invertebrates.

The insect collections are especially large and useful. Many

thousands of pinned specimens are arranged in the cabinets and these, together with the microscopical slides and alcoholic materials, constitute one of the best insect collections in the west.

The library contains a very valuable accumulation of books and pamphlets dealing with zoological subjects. It is especially strong in entomological literature. The more important scientific journals of this country and others are regularly received and the library has more or less complete sets of back numbers bound and placed on the shelves.

1. Invertebrate Zoology. 1 Q. Autmun. 6 cr. Fee \$3. Mr. Spaulding.

Invertebrate animals, including their morphology, development, habits, economical or popular interest and classification. Lect. 3; lab. 3.

2. Vertebrate Zoology. 1 Q. Spring. 6 cr. Prerequisite Zoology 1. Fee \$3. Mr. Spaulding.

Vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Elective to all students. Lect. 3; lab. 3.

3. Human Physiology and Anatomy. 1 Q. Winter. 6 cr. Prerequisite Zoology 1 or 15. Fee \$3. Mr. Spaulding.

Lectures and demonstrations presenting the main principles of animal physiology, the human body being used as the type, augmented by laboratory work in mammalian anatomy. Lect. 3; lab. 3.

4. Economic Entomology. 1 Q. Spring. 5 cr. Prerequisite Zoology 1. Fee \$2. Mr. Cooley.

Anatomy, metamorphosis and classification of insects; study of the various orders and of the principle families with particular reference to the species of economic importance. Lect. 3; lab. 2.

5. General and Systematic Entomology. 1 Q. Autumn. 5 cr. Prerequisite Entomology 4. Fee \$2. Mr. Cooley.

Morphology and classification of insects with some consideration of physiology, development, and adaptations. Lect. 2; lab. 3.

6. Advanced Economic Entomology. 1 Q. Winter. 5 cr. Prerequisite Entomology 4. Fee \$2. Mr. Cooley.

Insect pests and insect control. Lect. 2; lab. 3.

7. Advanced Entomology. 3 Q. Autumn, winter and spring. Continuous. 6 to 10 cr. Prerequisites Entomology 4, 5, 6. Fee \$2. Mr. Cooley.

Individual instruction to fit the students' needs, including systematic, economic, biological, and library work.

8. **Embryology.** 1 Q. Winter. 5 cr. Prerequisite Zoology 2 or 3. Fee \$3. Mr. Spaulding.

Formation and growth of tissues in the vertebrate body, based chiefly on the study of a chick, but including consideration of the development in the mammalian. Lect. 2; lab. 3.

9. **Organic Evolution.** 1 Q. Spring. 4 cr. Mr. Spaulding.

Evolution theories and their present status; also heredity, variation, natural and artificial selection, adaptations, etc. Lect. 4.

10. **Thesis.** Credits variable, not to exceed 5. Fee \$2 to \$10. Mr. Cooley or Mr. Spaulding.

Seniors in this department and seniors from other courses, who have had sufficient previous training, may elect this course.

11. **Economic Zoology.** 1 Q. Autumn. 3 cr. Prerequisite Zoology 1 or 2. Mr. Spaulding.

Discussion of vertebrates of economic importance and devoted chiefly to mammals and birds. Lect. 3.

12. **Physiology and Hygiene.** 1 Q. Winter. 6 cr. Fee \$3. Mr. Spaulding.

Graduate nurses' course. Dealing with the more important phases of physiology and hygiene, supplementing the work already taken, with laboratory work with living tissues. Lect. 3; lab. 3.

13. **Parasitology.** 1 Q. Spring. 4 cr. Prerequisite Zoology 1. Fee \$3. Mr. Spaulding.

The structure, life history and habits of the parasitic groups of animals. Lect. 2; lab. 2.

15. **General Biology.** 1 Q. Spring. 6 cr. Fee \$3. Mr. Spaulding.

The fundamental principles of plant and animal life, planned particularly for the needs of students in home economics. Lect. 3; lab. 3.

College of Household and Industrial Arts

The courses offered in the College of Household and Industrial Arts are: Applied Art, Home Economics, Applied Science for Women, and Secretarial Work.

The purpose of each of the courses is indicated by its title. The industrial application of the work is emphasized in each course. The applied art course and secretarial work are open to both men and women. Several subjects taught in departments not represented in the College of Household and Industrial Arts are open to election by students on consent of their adviser.

COURSE IN APPLIED ART

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
French (French 1)	4	4	4
Drawing (Art 1)	2	3	3
General Botany (Bot. 1)	5		
Design (Art 7)	3	2	
Painting (Art 2)		2	2
Perspective (Art 15)		2	
Clothing (H. E. 11a)			5
Physical Education (Phys. Ed. 1).....	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
French (French 2)	4	4	4
History of Art (Art 6).....	3	3	3
Historic Ornament (Art 7a).....	2	2	2
Drawing (Art 1a)	3		
Painting (Art 2a)	2		
Human Physiology and Anatomy (Zool. 3).....		6	
Foods (H. E. 1c)			5
Physical Education (Phys. Ed. 2).....	1	1	1

JUNIOR YEAR.

*Nineteenth Century Literature (Eng. 10) or *Contemporary Literature (Eng. 14)	3	3	3
Painting (Art 2a)	3		3
Advanced Design (Art 7b).....	2	2	2
Drawing (Art 1b).....	3		3
Medieval History (Hist. 2).....	3	3	3
Composition (Art 16)		2	
Handicraft (Art 10, 12, 13).....	2	2	2
Household Physics (Phys. 9)		5	
Elective	2		2

SENIOR YEAR.

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Psychology (Ed. 1)	3		
Modern Drama (Eng. 6)	2	2	2
Advanced Design (Art. 7c).....	3	3	3
Handicraft (Art 10, 12, 13)	2	2	2
Thesis (Art 19)	3	3	3
Elective	2	5	5

*Only one of these courses is offered each year.

COURSE IN APPLIED SCIENCE FOR WOMEN

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1)	4	4	4
French or Spanish	4	4	4
Elementary Analysis (Math. 16) or			
Engineering Mathematics (Math. 1, 2, 3).....	4-5	4-5	4-5
Physical Education (Phys. Ed. 1).....	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
European History (Hist. 1)	3	3	3
Modern History (Hist. 7)	3	3	3
Physical Education (Phys. Ed. 2).....	1	1	1

Option I.

Science option from groups tabulated below select..... 5-6 5-6 5-6

Autumn	Winter	Spring	
Zoology 1	Zoology 3	Entomology 4	
Chemistry 9	Botany 1	Botany 2	
Chemistry 5	Chemistry 9	Chemistry 9	
	Geology 1	Chemistry 8	
	Physics 14	Physics 14	
Electives			5 5 5

Option II

Engineering Physics (Phys. 1 and 2).....	5	5	5
Engineering Mathematics (4, 5, 6).....	5	5	5

JUNIOR YEAR.

*Nineteenth Century Literature (Eng. 10).....	3	3	3
Psychology (Ed. 1)	3		
Educational Psychology (Ed. 4).....		3	
Development of Vocational Education (Ed. 2).....			3
American History (Hist. 5).....	3	3	3
Science or Mathematics	5	5	5
Elective	4	4	4

SENIOR YEAR.

*Contemporary Literature (Eng. 14)	3	3	3
Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Science or Mathematics	5	5	5
Electives	7	7	7

*Only one of these courses is offered each year.

COURSE IN HOME ECONOMICS

FRESHMAN YEAR.

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1)	4	4	4
General Biology (Biol. 15)			6
Design (Art 7)	3	2	
Textiles (H. E. 13)		2	2
Clothing (H. E. 11)	3	3	
Foods (H. E. 1a)	4	2	
Dressmaking (H. E. 12)			3
Physical Education (Phys. Ed. 1).....	1	1	1

SOPHOMORE YEAR.

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Organic Chemistry (Chem. 5)	6		
Food Chemistry (Chem. 8)			6
Foods (H. E. 2)			4
Physiology (Zool. 3).....		6	
Household Physics (Phys. 9)		5	
Foods (H. E. 1b)	3		
Millinery (H. E. 17).....			3
House Planning (A. E. 13)			2
General Bacteriology (Bact. 12)	6		
Sanitary Bacteriology (Bact. 13).....		3	
Physical Education (Phys. Ed. 2).....	1	1	1

JUNIOR YEAR.

General Psychology (Ed. 1)	3		
Modern Drama (Eng. 6)	2	2	2
House Furnishing (Art 8b)		3	
Costume Design (Art 8)	5		
Physiological Chemistry (Chem. 11).....		5	
Food Economics (H. E. 4)			4
Medieval History (Hist. 2) or			
American History (Hist. 5)	3	3	3
Elective	5	5	9

SENIOR YEAR.

*Nineteenth Century Literature (Eng. 10) or			
*Contemporary Literature (Eng. 14)	3	3	3
Home Problems (H. E. 10)		4	
Dietetics (H. E. 6)	6		
Advanced Needle Work (H. E. 18).....			3
Embroidery Design (Art 8a).....			2
Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Elective	6	8	7

*Only one of these courses is offered each year.

COURSE IN SECRETARIAL WORK

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1)	4	4	4
Modern Language	4	4	4
European History (Hist. 1)	3	3	3
Shorthand (Sec. 1)	2	2	2
Typewriting (Sec. 3)	1	1	1
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Modern History (Hist. 7)	3	3	3
Principles of Accounting (Sec. 9)	3	3	3
Modern Language	4	4	4
Commercial Law (Sec. 8)	3	3	
Business Correspondence (Sec. 5)			3
Shorthand (Sec. 2)	1	1	1
Typewriting (Sec. 4)	1	1	1
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

*Nineteenth Century Literature (Eng. 10) or *Contemporary Literature (Eng. 14)	3	3	3
Economics (Econ. 3)	3	3	
Elementary Analysis (Math. 16)	4	4	
Theory of Investments (Math. 15).....			3
Industrial History (Hist. 10)	3	3	3
Economics of Business (Sec. 7)	2	2	
Office Practice (Sec. 6)			3
Advanced Accounting (Sec. 10)	3	3	3
Elective			6

SENIOR YEAR.

*Nineteenth Century Literature (Eng. 10) or *Contemporary Literature (Eng. 14)	3	3	3
American History (Hist. 5)	3	3	3
Salesmanship (Sec. 16)	3	3	
Principles of Business (Sec. 14)		3	3
Sociology (Sec. 4)			3
Psychology (Ed. 1)	3		
Elective	6	6	6

*Only one of these courses is offered each year.

TWO YEARS' COURSE IN SECRETARIAL WORK

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1)	4	4	4
Modern Language	4	4	4
European History (Hist. 1)	3	3	3
Shorthand (Sec. 1)	2	2	2
Typewriting (Sec. 3)	1	1	1
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1).....	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Modern History (Hist. 7)	3	3	3
Principles of Accounting (Sec. 9)	3	3	3
Modern Language	4	4	4
Commercial Law (Sec. 8)	3	3	
Business Correspondence (Sec. 5)			3
Shorthand (Sec. 2)	1	1	1
Typewriting (Sec. 4)	1	1	1
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

Courses of Instruction

APPLIED ART.

PROFESSOR, LANA BALDWIN. INSTRUCTOR, MURIEL MOORE.

The applied art course is outlined to give a thorough training in drawing and in the use of color. The object of the study being to prepare students for studio work as designers, craftsmen, or decorators, and also to prepare them to teach drawing and handicraft in elementary, grammar and high schools. The course includes the study of line, form, color, historic ornament, principles of design and composition and technical methods in applied design. It insures a broad foundation of art culture and skill which will enable students to make practical use of their training. Exceptional facilities are offered for the study of design and composition and the course is strengthened by the many phases of related art work.

1. Freehand Drawing. 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$.50. Miss Moore.

Drawing from the cast in charcoal pencil, or pen and ink. Lab. 2 to 4.

1a. Freehand Drawing. 3 Q. Autumn, winter and spring. Continuous. 3 to 9 cr. Fee \$.50. Miss Moore.

Continuation of Art 1. Lab. 2 to 4.

1b. Freehand Drawing. 2 Q. Autumn, winter and spring. Fee \$.50. Miss Moore.

Continuation of Art 1. Lab. 3.

2. Painting. 3 Q. Autumn, winter and spring. Continuous. 4 to 8 cr. Prerequisite Art 1. Fee \$.50 Miss Baldwin.

Water colors, oils and tempera. Work from nature and still life.

2a. Painting. 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$.50. Miss Baldwin.

Continuation of Art 2.

3. Architectural Drawing. 2 Q. Winter and spring. 4 cr. Fee \$.50. Miss Moore.

Drawing from still life and casts. Study of architectural details, and sketching from nature. Work executed in pencil, pen and ink, and charcoal. Lab. 4.

3a. Architectural Drawing. 2 Q. Autumn and winter. 6 cr. Prerequisite Art 3. Fee \$.50. Miss Moore.

Continuation of Art 3. Problems in composition and design. Work executed in pencil, charcoal, wash, and color. Lab. 3.

4. Drawing from Nature. 1 Q. Autumn, or winter, or spring. 2 cr. Fee \$.50. Miss Moore.

Pencil, pen and ink, wash and color. Intended especially for students in biology. Lab. 2.

6. History of Art. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Miss Baldwin.

Intended especially for students in design. Historic ornament and the classic styles as exemplified in painting, sculpture and architecture. Lect. 3.

7. Design. 2 Q. Autumn and winter. 5 cr. Fee \$.50. Miss Baldwin.

Applied design and use of water color. Students submit original designs. Lab. 2. Lect. 1; lab. 2.

7a. Historic Ornament. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite Art 7. Fee \$.50. Miss Baldwin.

Historic ornament with analysis of historic examples of design. Original problems executed in black and white and in color. Lab. 2.

7b. Advanced Design. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Baldwin.

Original designs for commercial purposes executed to meet the requirements and conditions of reproduction. Lab. 2.

7c. Advanced Design. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Fee \$.50. Miss Baldwin.

Continuation of 7b. Lab. 3.

8. Costume Design. 1 Q. Autumn. 5 cr. Fee \$3. Miss Moore.

Study of design, color and texture suitable for various types of individuals and occasion. Practical application to dress. Lect. 3; lab. 2.

8a. Embroidery Design. 1 Q. Spring. 2 cr. Fee \$.50. Miss Baldwin.

Theory of color and design; original designs for embroidery. Lab. 2.

8b. House Furnishing. 1 Q. Winter. 3 cr. Fee \$.50. Miss Baldwin.

Color, line and form as applied to house furnishings. Lect. 1; lab. 2.

8c. Decorative Periods. 1 Q. Winter. 3 cr. Prerequisite Art 8b. Fee \$.50. Miss Baldwin.

Advanced work in interior decoration. Decorative styles and

their adaptation to modern uses. Original designs for interiors executed in color. Lect. 1; lab. 2.

10. **Decoration of China.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee \$2; deposit \$4. Miss Moore.

China is fired in the studio. Lab. 2.

11. **Leather.** 1 Q. Autumn or winter or spring. 2 cr. Prerequisite Art 7. Fee \$3. Miss Baldwin.

Tooling, modeling, and embossing; also use of dyes and stains for leather. Lab. 2.

Owing to the scarcity of materials due to the war, this course will not be offered until further notice is given. A substitute course in decorative painting will be given.

12. **Jewelry.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$3. Miss Baldwin.

Making of simple and unique jewelry in gold, silver, and in copper. Saw-piercing, enameling, repousse and the setting of semi-precious stones. Lab. 2 to 4.

13. **Metal.** 1 Q. Winter. 2 to 4 cr. Fee \$3. Miss Baldwin.

Work in copper, brass, and silver. Raising, sawpiercing, etching, hard and soft soldering and riveting. Lab. 2 to 4.

Owing to the scarcity of materials due to the war, this course will not be offered until further notice is given. A substitute course in decorative painting will be offered.

14. **Basketry.** 1 Q. Winter. 2 cr. Fee \$3. Miss Baldwin.

Making of baskets of reeds and raffia and other suitable materials. Dyes and dyeing baskets. Use of native materials in original work in basketry. Lab. 2.

15. **Perspective.** 1 Q. Winter. 2 cr. Fee \$.50. Miss Moore.

Principles of angular and parallel view perspective taught by means of freehand sketches and drawings. Work executed in pencil, pen and ink, wash and color. Lect. 1; lab. 1.

16. **Composition.** 1 Q. Winter. 2 cr. Fee \$.50. Miss Moore.

Art structure as a means of expression. Original compositions in light and dark, line and color. Lect. 1; lab. 1.

17. **Practice Work in Teaching.** 1 Q. Autumn or winter or spring. 2 cr. Miss Baldwin.

Teaching drawing, painting, design and handicrafts.

18a. **Methods.** 1 Q. Winter. 3 cr. Fee \$.50. Miss Baldwin.

Methods of teaching drawing, painting and design. Lesson plans and materials. Lect. 2; lab. 1.

18b. **Methods.** 1 Q. Spring. 3 cr. Fee \$.50. Miss Baldwin.

Methods of teaching the handicrafts; metal, jewelry, leather, basketry, wood block painting, and stenciling. Lesson plans. Materials and equipment. Lect. 2; lab. 1.

19. **Thesis.** 3 Q. Autumn, winter and spring. 9 cr. Fee \$1 to \$5. Miss Baldwin.

HOME ECONOMICS

PROFESSOR, ALBA BALES. ASSISTANT PROFESSORS, CARLOTTA FORD, EDITH FRANKS, EMMA GARRISON. INSTRUCTOR, LAURA RANDALL.

The department of home economics offers the following courses designed to meet the needs of students:

1. Those students who wish to teach home economics in the secondary schools.
2. Those students who desire a liberal education which shall include definite training in household arts and sciences.
3. Those students who wish to specialize in some phase of household science or art which will prepare them for professions other than teaching or home making.
4. Those students who wish to prepare for field work or extension work.

The students who desire to prepare themselves to teach home economics will complete the Teachers' Course. Those who desire to specialize in some phase of household arts or science, or prepare for extension work, will include beyond the work of the freshman and sophomore years of the Teachers' Course, advanced courses in chemistry, foods, and textiles suggested by the faculty, which will prepare them to enter commercial pursuits in textiles, to take a position as dietitian, institutional manager, professional housekeeper, or to enter the extension field.

1a. **Foods.** 2 Q. Autumn 4 cr. Winter 2 cr. Fee \$3.50 and \$1.50. Miss Franks.

This course deals with the principles involved in cookery processes and a thorough study of food principles and food composition.

Students who have had two years' work in cookery in a good high school are scheduled in a separate section and are given more advanced work. Those students may be excused from Course 1b in the sophomore year if it is thought advisable by the instructors.

1b. **Foods.** 1 Q. Autumn. 3 cr. Fee \$2.50. Prerequisites Chemistry 1, Home Economics 1a. Miss Franks.

This course deals with the more complex cookery processes and development of technique and cookery principles involved in the more advanced courses in foods.

1c. **Foods.** 1 Q. Spring . 5 cr. Fee \$2.50. Miss Franks.

A study of food principles, cookery processes, fundamentals of

meal planning and serving. Open to freshmen and sophomore applied art students. Lect. 2; lab. 3.

2. **Food Studies.** 1 Q. Spring. 4 cr. Fee \$3. Prerequisites Home Economics 1, Chemistry 5, Zoology 3. Miss Ford.

Application of the science underlying the selection and preparation of foods. The dishes prepared illustrate the scientific principles involved.

4. **Food Economics.** 1 Q. Spring. 4 cr. Fee \$4. Miss Franks.

Planning family meals relative to the nutrition and cost. Serving of various types of meals. Some work in fancy cookery. Open to students of junior standing. Lab. 2; lect. 1.

4a. **Food Preservation.** 1 Q. 3 cr. Fee \$1. Miss Franks.

The theory, equipment, and methods of this course will be given in one lecture per week. Outlines for practical work are given the students who do the practical work as a summer project at their homes during the summer vacation.

5. **Seminar.** 1 Q. Spring. 3 cr. Prerequisites Home Economics 6, Chemistry 11, Bacteriology 12, Physics 9. Miss Ford and Departmental Faculty.

Students will read and abstract articles from current magazines and books. Two papers will be required. Meetings weekly.

6. **Dietetics.** 1 Q. Autumn. 6 cr. Fee \$4. Prerequisites Home Economics 2, Chemistry 11, Bacteriology 12. Miss Ford.

Human nutrition and metabolism, the relation of food to health and disease, the construction and preparation of dietaries. Lect. 3; lab. 3.

7. **Household Administration.** 1 Q. Winter or spring. 8 cr. Fee \$.50. Miss Ford.

Study of family income; the budget; methods of keeping household accounts; marketing; problems of domestic science; methods of housekeeping; methods of laundering; economic food studies. During this course groups of four students spend four weeks in the practice house.

8. **Extension Course.** 1 Q. Winter. 6 cr. Fee \$3. Open to seniors in Home Economics. Miss Rowe, Miss Ford.

Special methods in field work. Presentation of demonstrations and making outlines for field work. Students will do some field work under supervision of the extension staff. Lect. 2; lab. 2.

9. **Home Nursing.** 1 Q. Winter. 2 cr. Open to juniors in Home Economics. Miss McCray.

A study of the care of sick in the home, sick room, medicine cases, and nurses equipment. One lecture and one demonstration weekly.

10. **Home Problems.** 1 Q. Winter or spring. 4 to 6 cr. Deposit \$.50 to \$6. Miss Bales, Miss Ford.

Individual work is required. The student is given opportunity to carry on original or suggested investigation in food work, or along economic lines pertaining to some phase of the home. Open to seniors only.

11. **Clothing.** 2 Q. Autumn and winter. 6 cr. Fee \$2. Miss Garrison

Hand and machine sewing applied to useful articles and garments. Drafting simple patterns, use and alteration of drafted and commercial patterns. Subject matter for elementary and secondary schools is emphasized. Lect. 1; lab. 2.

Where necessary to strengthen the technique in sewing, summer projects will be assigned between Freshman and Sophomore years.

12. **Dressmaking.** 1 Q. Spring. 3 cr. Fee \$1. Prerequisite Home Economics 11. Miss Garrison.

Use of drafted and commercial patterns for elementary dress design, and construction Lect. 1; lab. 2.

13. **Textiles.** 2 Q. Winter and Spring. 4 cr. Fee \$2. Miss Garrison.

A study of the history, production, identification and testing of textiles, developing judgment in selection of fabrics for the house and for clothing. Lect. 1; lab. 1.

14. **Advanced Dressmaking.** 1 Q. Spring. 4 cr. Fee \$1. Prerequisites Home Economics 11, 12, 13 and Art 8. Miss Garrison.

Advanced problems in pattern designing applied to silk and wool garments.

16. **Draping and Designing.** 1 Q. Autumn. 3 cr. Fee \$1. Miss Garrison.

This course aims to develop originality in designing garments and greater skill in the handling of materials through the construction of afternoon and evening gowns, on the dress form. Lect 1; lab. 2.

17. **Millinery.** 1 Q. Spring. 3 cr. Fee \$2. Miss Garrison.

Renovating and remodelling summer materials and hats, problems in construction, covering and trimming. Students are urged to bring from home old hats and trimmings for use in this course. Lect. 1; lab. 2.

17a. **Millinery.** 1 Q. Autumn. Elective. 3 cr. Fee \$2. Miss Garrison.

Construction of hat frames of various types; plain covering, trimming, renovation and use of old materials. Lect. 1.; lab. 2.

18. **Advanced Needle Work.** 1 Q. Spring. 3 cr. Fee \$1. Miss Garrison.

This course deals with useful decorative stitches and their application to clothing and household textiles.

19. **Therapeutic Cookery.** 1 Q. Winter. 2 cr. Fee \$1. Miss Ford.

The food requirements of abnormal cases. Preparation of dietaries. Setting the tray. Lect. 1; lab. 1.

20. **Experimental Cookery.** 1 Q. 3 cr. Fee \$2. Miss Ford.

This course affords an opportunity for quantitative experimental work in the field of cookery. Lect. 1; lab. 2.

22. **Child Care and Training.** 1 Q. 2 cr. Miss Bales

A study of the mental and physical developments of the child and those influences which promote normal growth and health. Lect. 2.

23. **Dietetics.** 1 Q. Winter or spring. 3 cr. Prerequisite Home Economics 6. Fee \$4. Miss Ford.

Special attention is given to the study of recent advances in the science of nutrition and to training for specialized work in the field of nutrition. Lect. 2; lab. 1.

SECRETARIAL STUDIES

PROFESSOR, R. O. WILSON. ASSISTANT PROFESSOR, W. B. HOLMES.
INSTRUCTOR, DELLA YOUNG.

The course in secretarial work requires fifteen units of preparation and extends through four years. The technical work is planned to be directly applicable to business, and broad enough to serve as a basis for such positions as private secretary, office manager, etc.

The course includes a thorough grounding in English, and at least one modern language—French or Spanish, together with work in science, history, and social science. Women may elect some work in home economics. The technical work includes business procedure, office management and practice, business law, principles of accounting, principles underlying business activities, business statistics, shorthand and typewriting.

The degree Bachelor of Science is conferred upon students who have completed satisfactorily the prescribed four-years college course in secretarial work.

The two-years secretarial course is intended for those who can-

not take the time to complete a four-years course. The completion of a high school course or its equivalent is required for entrance.

1. **Shorthand.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Young.

Fundamental principles of shorthand practice in word building, phrasing and dictation. Lect. 4.

2. **Shorthand.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Young.

Practice in writing letters, legal papers, testimony, and miscellaneous matter. Students who take this course will also take Secretarial 4. Lect. 3.

3. **Typewriting.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Fee \$1. Miss Young.

Use and care of typewriters. Exercises for the development of proper wrist and finger movements, and for the mastery of the key board. Practice in letter writing and the use of carbon. Lab. 4.

4. **Typewriting.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Fee \$1.00. Miss Young.

Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; practice in the use of the mimeograph. Students who take this course will also take Secretarial 2. Lab. 3.

5. **Business English and Correspondence.** 1 Q. Spring. 3 cr. Mr. Wilson.

A practical course in business correspondence. Lect. 3.

6. **Office Practice.** 1 Q. Spring. 3 cr. Miss Young.

Practice with various kinds of office appliances and equipment, such as adding machines, addressing machines, filing, etc. Lect. 1; lab. 1.

7. **Economics of Business.** 2 Q. Autumn and winter. 4 cr. Mr. Holmes.

This course offers a general survey of the principles underlying business activities. Lect. 2.

8. **Commercial Law.** 2 Q. Autumn and winter. 6 cr. Mr. Holmes.

Students will be required to familiarize themselves with the rights and liabilities of parties to common business transactions, as contracts, sales, deeds, mortgages; and with the drawing up and validity of commercial paper and contracts. Text and cases. Lect. 3.

9. **Principles of Accounting.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Holmes.

Principles underlying accounting in general. Laboratory exercises. Lect. 1; lab. 2.

10. **Advanced Accounting.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Holmes.

The science of accounting will be taught in this course from both the theoretical and practical standpoints. Corporation accounting will be introduced and cost accounting will be developed. The course will also include a study of different accounting systems with the object of fitting the students to plan or improve accounting systems for various types of businesses.

14. **Principles of Business.** 2 Q. Winter and spring. 6 cr. Mr. Holmes.

A treatment of business as a science, as a group of activities governed by laws and rules, whose relation to the other sciences is intimate. Consideration of scientific methods of financing and management as they may be applied to business. Analysis of financial statements. Lect. 3.

16. **Salesmanship and Business Efficiency.** 2 Q. Autumn and winter. 6 cr. Mr. Holmes.

A study of the fundamental principles and philosophy of human leadership, mental and business efficiency, and the science and art of salesmanship. Lect. 3.

Courses in Vocational Education for Teachers

Courses for the preparation of high school teachers and leaders in the various field of agricultural, industrial and home economics education are offered according to the Federal plan for Vocational Education under the provisions of the Smith-Hughes Act of Congress passed in February, 1917.

The work is so arranged in kind and quantity as to make it possible for students who desire a general course in agriculture, manual arts, and home economics, to obtain such a course and at the same time secure a preparation, which will enable them to qualify as teachers of these subjects, and for extension work. Three separate courses, each providing four years' instruction, are offered for persons who desire to fit themselves for the work indicated above.

A present and growing need in Montana is for men who have had special training for county agent and demonstration work. The time is not far distant when every county in the state will demand an agricultural specialist, one who will assist farmers in matters of organization, co-operation, pure bred stock and a more scientific cultivation of the soil. Students who are preparing for this work will be given an opportunity to visit counties where agents are employed, take in extension schools, study the methods of the different extension specialists at the college, and under the direction of the department and state county agent leader prepare extension projects. In so far as possible, the student in his preparation will meet the problems which he will later meet in the field.

The special training begins with the junior year in each course. The freshman and sophomore years in the agricultural courses prepare for the junior year of the course in Agricultural Education and Extension Methods. The freshman and sophomore years in the applied science courses will be accepted when they include not less than sixteen credits of agriculture. The freshman and sophomore years in home economics prepare for the junior year of the Teachers' Course in Home Economics. The freshman and sophomore years in any of the engineering courses prepare for the junior year in the Teachers' Course in Trades and Industry.

COURSE IN AGRICULTURAL EDUCATION AND EXTENSION METHODS

JUNIOR YEAR

	Autumn	Winter	Spring
Economics (Econ. 3)	3		
Agricultural Economics (Econ. 5)		3	
Dry Land Farming (Agron. 11)	3		
Breeds of Live Stock (An. Husb. 2, 2a)		5	4
Forage Crops (Agron. 11)			5
Development of Vocational Education (Ed. 3)			3
Psychology (Ed. 1)	3		
Rural Life Problems (Agr. Ed. 3)		3	
Common Diseases (Vet. Sci. 57)		5	
Farm Woodworking (T. I. 5)			3
Poultry Breeds (Poult. Husb. 42)	4		
Elective	5	4	3

SENIOR YEAR.

Principles of Breeding (Agron. 7)	6		
Beef Cattle and Sheep Production (An. Husb. 7)		5	
Teaching Practice (Agr. Ed. 2)		3	3
Vocational Agricultural Education (Agr. Ed. 1)		3	
Cooperation and Extension Methods (Agri. Ed. 4)		3	
Cooperation and Extension Methods in Field (Agri. Ed. 5)			3
Theory and Practice of Teaching (Ed. 5)	3		
Irrigation Farming (Agron. 14)		5	
Thesis (Agr. Ed. 7)			3
Electives	9	4	4

COURSE IN HOME ECONOMICS FOR TEACHERS

JUNIOR YEAR

	Autumn	Winter	Spring
Psychology (Ed. 1)			
Theory and Practice (Ed. 5)	3		
Development of Vocational Education (Ed. 2)			3
Costume Design (Art 8)	5		
Advanced Dressmaking (H. E. 14)			4
Physiological Chemistry (Chem. 11)		5	
Food Economics (H. E. 4)			4
House Furnishings (Art 8b)		3	
Home Nursing (H. E. 9)		2	
English or History	3	3	3
Elective	4	5	4

SENIOR YEAR

Dietetics (H. E. 6)	6		
Household Administration (H. E. 7)		8	
Educational Psychology (Ed. 4)	3		
Sociology (Soc. 4)			3
Special Methods (H. E. Ed. 2)	3	3	
*Teaching Practice (H. E. Ed. 1)			
Home Problems (H. E. 10)			4
Economics (Econ. 3)	3	3	
Elective	0-3	1-4	8-11

*Teaching Practice three credits is required during one quarter of the senior year.

COURSE IN TRADES AND INDUSTRY FOR TEACHERS

JUNIOR YEAR

	Autumn	Winter	Spring
Economics (Econ. 3)	3	3	
Engineering Economics (C. E. 45)			3
Organization and Administration of Ind. Education (T. I. 9).....			9
Applied Mechanics (C. E. 6)	5		
Psychology (Ed. 1)	3		
Educational Psychology (Ed. 4)		3	
Heat Engines (M. E. 7)		3	
Industrial Organization and Management (M. E. 25)			3
Carpentry (T. I. 1 and 2).....	3	3	
Machine Work (M. E. 27)	2	2	2
Cabinet Work (T. I. 3)			3
Foundry (M. E. 4a)		2	
Elective	2	2	5

SENIOR YEAR.

Electrical Machinery (E. E. 1).....	2		
Electric Power (E. E. 14 and 14a).....		3	4
Mechanical Laboratory (M. E. 15a)		2	
Principles of Teaching Trades and Industry (T. I. 12)		3	
Teaching Practice (T. I. 13)		3	3
Experience in Industries (T. I. 10)	3		3
Manufacturing Methods and Machinery (T. I. 31).....	3		
Thesis (T. I. 14)			3
Theory and Practice of Teaching (Ed. 5)	3		
Elective	4	7	5

TWO YEARS COURSE IN TRADES AND INDUSTRY

The two years course is intended for the training of shop teachers. The attendance will be limited to those who have become masters of a trade, or to those who are at the time of enrollment acquiring such a mastery. In addition to the two years course of study as outlined, there is required two summers of practical work on a wage-earning basis in one of the following capacities: Shop work as a helper or journeyman, as a carpenter, machinist, plumber, sheet metal worker, electrical constructionist, or auto mechanic. Such work is to be done during the summer months after the first and second years of the course.

The Superintendent of Public Instruction has the power to issue special certificates to persons showing satisfactory evidence of special proficiency in teaching trade and industrial subjects. Successful completion of the two years trades and industry course is regarded as sufficient evidence of this qualification.

FIRST YEAR.

	Autumn	Winter	Spring
English (Eng. a)	4	4	
Algebra (Math. a)	4	4	
Plane Geometry (Math. c)	4	4	
Mechanical Drawing (M. A. m).....	2	2	
Military Science (Mil. Sci. a).....	1	1	1
Organization and Administration of Industrial Education (T. I. 9)..			2
Solid Geometry (Math. d)			4
Shop Work and Electives	3	3	11

SECOND YEAR.

Physics (Phys. a)	4	4	4
General Psychology (Ed. 1)	3		
Educational Psychology (Ed. 4)		3	
Theory and Practice of Teaching (Ed. 5).....	3		
Principles of Teaching Trades and Industry (T. I. 12)		3	
Mechanical Drawing (M. A. n)	2	2	
Teaching Practice (T. I. 13)		3	3
Military Science (Mil. Sci. b).....	1	1	1
Shopwork and Electives	5	4	10

Note—The required shop work is in subjects which are classed in or allied to the trade from which the applicant comes, or to the future teaching work for which he is preparing himself. In handling such shop courses chief emphasis is made of the analysis of the work; the planning of teaching contents; and lesson plans for the type of schools and pupils which the individual is preparing to teach, rather than upon manual skill, which is presumably already his.

Courses of Instruction

AGRICULTURAL EDUCATION.

PROFESSOR, M. J. ABBEY.

1. Vocational Agricultural Education. 1 Q. Winter. 3 cr.

For students preparing to teach vocational agriculture in the high schools. Organization of the class, equipment, laboratory instruction, field excursions, projects, community work and agricultural clubs.

1a. Vocational Agricultural Education. 3 Q. Autumn, winter and spring. Continuous. 4 cr.

A course in itinerant teacher training. For persons who are already engaged in teaching agriculture.

2. Teaching Practice in Agriculture. 2 Q. Winter and spring. Continuous. 6 cr.

The preparation of lesson plans and outlines with an opportunity to observe and teach classes in secondary agriculture.

3. Rural Life Problems. 1 Q. Winter. 3 cr.

The fundamental problems of rural life, social, political, religious, and educational agencies and methods of correlation. As the basis of the course, a survey of typical rural community will be made.

4. Cooperation and Extension Methods. 1 Q. Winter. 3 cr.

Practical preparation for county agent work and modern methods of cooperative enterprises in agriculture.

5. Cooperation and Extension Methods in the Field. 1 Q. Spring. 3 cr.

Students will be required to do field work with county agents and specialists. Students will assist in extension schools and community meetings.

6. Supervision. 3 Q. Autumn, winter and spring. Continuous. 1 cr.

A course in itinerant and follow-up instruction for teachers of agriculture in schools receiving aid under the provisions of the Smith-Hughes Act and supplementary state legislation.

7. Seminar and Thesis. 1 Q. Spring. 3 cr.

Each student must prepare a suitable thesis upon some subject relating to his course. The subject to be chosen early in the senior year after consultation with the class adviser.

EDUCATION AND PSYCHOLOGY.

PROFESSOR, J. M. O'GORMAN.

1. Psychology. 1 Q. Autumn. 3 cr.

General view of modern psychology, methods and materials of psychological investigation.

2 Development of Vocational Education. 1 Q. Spring. 3 cr.

A brief survey of industrial education prior to 1800, some of the most significant developments during the nineteenth century, and the present status and need, including a brief study of vocational guidance.

4. Educational Psychology. 1 Q. Winter. 3 cr. Prerequisite Psychology 1, or its equivalent.

This will include some genetic and experimental psychology. Intensive study will be made of the native equipment of human beings, and the psychology of learning. A brief survey of the more elementary statistical means of measuring the educational product will be made.

5. Theory and Practice of Teaching. 1 Q. Autumn. 3 cr.

A study of the aims of education in the democracy, the fundamentals and technique of class room instruction and management, and the use of scales in tests for measuring the educational product.

HOME ECONOMICS EDUCATION.

PROFESSOR, ALBA BALES. ASSISTANT PROFESSORS, CARLOTTA M. FORD, EDITH FRANKS.

1. Teaching Practice in Home Economics. 1 Q. Autumn, winter or spring. 3 cr. Miss Bales.

Preparation of lesson plans and outlines with an opportunity to observe and teach classes.

2. Special Methods in Home Economics. 2 Q. Autumn and winter. 6 cr.

Theory and practice of teaching domestic science and domestic art. Study is made of courses in various types of institutions. Courses of study are planned for graded schools, high schools and colleges. Lesson plans are given especial attention. Lect 3; lab. 1.

3. Education of Women. 1 Q. Autumn. 3 cr. Miss Bales.

Survey of women's education, origin, and development of home economics.

TRADES AND INDUSTRY.

ASSISTANT PROFESSOR, R. T. CHALLENGER.

1. **Carpentry.** 1 Q. Autumn. 3 cr. Prerequisite Mechanical Engineering 2. Fee \$3.

Framing and rafter cutting. Special application is made of the subjects of plane geometry and descriptive geometry in the formulation of rafter cutting rules, which by means of the steel square are applied in the framing of model structures and roofs.

2. **Carpentry.** 1 Q. Winter. 3 cr. Prerequisite Trades and Industry 1. Fee \$3.

Continuation of Trades and Industry 1, with instruction in the use and care of special hand tools and power machines in the construction of window and door frames and interior finish. A study is made of the different styles of interior trim and arrangement of built-in fixtures.

3. **Cabinet Work.** 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 2. Fee \$1.

Study is made of courses of instruction suitable for grade and high school use in wood work, and in the proportion and design of standard projects in wood. Instruction and care of wood working machines as applied to school use is emphasized. Written reports will be required on current articles dealing with the subjects enumerated above and such subjects as stains, varnishes, glues, and paints. Lect. 2; lab. 1.

5. **Wood Work.** 1 Q. Autumn. 2 cr. Fee \$3; deposit \$2.

Use and care of carpenters' tools and practice in working dimensions from blue-prints, building construction, roof framing and mill work. Lab. 2.

6. **Pattern Work.** 1 Q. Spring. 3 cr. Prerequisite Mechanical Engineering 2a. Fee \$3.

Continuation of Mechanical Engineering 2a. Advanced work in the construction of patterns and match board work, together with a study of the methods employed in large pattern shops in the marketing and storage of patterns.

9. **Organization and Administration of Industrial Education.** 1 Q. Spring. 2 cr.

Study of Federal Acts furthering Industrial Education; the Smith-Hughes Law; Montana plans for Industrial Education; plans for organizing and handling evening classes; part-time classes; unit trade schools and classes.

10. **Experience in Industries.** 2 Q. Autumn and spring. 6 cr.

With the cooperation of industrial concerns and with their supervision, practical work will be offered in planing mills, plumbing shops,

and electrical shops. A grade of work satisfactory to the employer and the instructor in charge of the course will be required. Courtesy, obedience to orders, interest in the work and the quality of the work done, are some of the determining factors.

12. **Principles of Teaching Trades and Industry.** 1 Q. Winter. 3 cr.

The aims of education as they apply to the teaching of trades and industry subjects. Methods of organizing and conducting day and part time classes. Correlating school instruction with the present day economic demands.

13. **Teaching Practice in Trades and Industry.** 2 Q. Winter and spring. 6 cr.

Preparation of lesson plans and outlines with an opportunity to observe and teach classes.

14. **Thesis.** 1 Q. Spring. 4 cr.

Before graduation each student must present a suitable thesis upon some subject pertaining to the trade and industry work for schools.

Course for Nurses

It is the purpose of the State College of Agriculture and Mechanic Arts of the University of Montana to conduct a one year course for the thorough, scientific training of the nurse.

This is best assured by the cooperation of the State College and the accredited training schools for nurses. It is the desire, also, of the college to make it the means of advancing the education of nursing women in Montana.

This course invites to matriculation, women of superior education and of large and earnest purpose, but most earnestly seeks the young woman, who, having finished her high school course, wishes to take the three years training to become a registered nurse.

The State College is cooperating with some of the best known hospitals of the state, and at the end of one year's scientific training and the study in the laboratories, lectures, classes, and demonstrations, in the State College, the training schools will receive the successful student for two years practical work in the hospital.

The three years of work thus outlined leads to nursing work in private cases, laboratories, operating rooms; public health, X-ray work; office and school nurses.

The student showing organizational ability may prepare for the positions of hospital superintendents and managers.

There is a distinct advantage in taking the scientific work as outlined, as a preparation for the practical work, as this gives the students an opportunity of institutional training in their every day living as the students registering for this course will live in Hamilton Hall and share in the social training with the other college women.

COURSE FOR NURSES.

	Autumn	Winter	Spring
English Composition (Eng. 11)			
General Chemistry (Chem. 1)	4	4	4
Elementary Bacteriology (Bact. 15)			5
Invertebrate Zoology (Zool. 1).....	6		
Human Physiology and Anatomy (Zool. 3)		6	
Organic Chemistry (Chem. 5)	5		
Foods (H. E. 2).....			4
Dietetics (H. E. 23)			4
Physical Education (Phys. Ed. 3)	2	2	2
Elective		7	

Courses in General

ECONOMICS AND SOCIOLOGY.

PROFESSOR, J. M. HAMILTON.

3. **Economics.** 2 Q. Autumn and winter. 6 cr.

Principles of economic science. Study of such questions as trusts, labor and capital, money and banking, transportation, and taxation. Lect. 3.

4. **Sociology.** 1 Q. Spring. 3 cr.

Introduction to sociology. Attention given to the problems of marriage and divorce, immigration, race questions, charities and corrections, pauperism and crime. Lect. 3.

6. **Agricultural Economics.** 1 Q. Winter. 3 cr. Prerequisite Economics 3.

Agricultural economic problems; land problems; agricultural labor; rural credit; cooperative associations; markets. Lect. 3.

7. **Rural Sociology.** 1 Q. Spring. 3 cr. Prerequisite Sociology 4.

Rural social problems; the farm home; rural health; country church; rural schools; roads; recreations, etc. Lect. 3.

10. **Irrigation Institutions and Economics.** 1 Q. Spring. 3 cr.

History and development of irrigation in western United States; riparian rights; doctrine of appropriation; legal duty of water; adjudication of water rights; Carey Land Act; National Reclamation Service; Montana irrigation laws. Lect. 3.

ENGLISH.

PROFESSOR, W. F. BREWER. ASSOCIATE PROFESSOR, E. A. DUDDY.
INSTRUCTORS, JESSIE DONALDSON, DORIS MCCART, GERTRUDE SIBLEY.

In all the courses in English, written work plays an important part. That this work may be kept up to the proper grade, it is announced here that in college English work no paper will receive any credit that shows notable carelessness or ignorance in elementary matters of punctuation, grammar, rhetoric, or in the spelling of common words.

1. **English Composition.** 1 Q. Autumn, winter. 3 cr. Mr. Brewer, Miss Donaldson, Miss McCart, Miss Sibley.

1a. **English Composition.** 1 Q. Winter, spring. 3 cr. Mr. Brewer, Miss Donaldson, Miss McCart, Miss Sibley.

1b. **English Composition.** 1 Q. Spring. 3 cr. Mr. Brewer, Miss Donaldson, Miss McCart, Miss Sibley.

Rhetorical Principles. Written and oral composition with study of types of prose composition.

2. **Expository Composition.** 1 Q. Autumn, winter. 2 cr. Mr. Duddy.

2a. **Expository Composition.** 1 Q. Winter, spring. 2 cr. Mr. Duddy.

2b. **Expository Composition.** 1 Q. Spring. 2 cr. Mr. Duddy. English 2, 2a, 2b, required of all sophomores.

Instruction in the handling of units of expository composition from 300 to 600 words. As a basis for the written work, essays adapted to the vocational outlook of the students are assigned for reading each week and discussed orally in the class room. The subjects of the essays are such as will relate the student's idea about his vocation to the various fields of knowledge with which he must come in contact either as student or vocational worker.

3. **Advanced English Composition.** 1 Q. Autumn. 2 cr. Mr. Brewer.

Elective for juniors and seniors.

3a. **Advanced English Composition.** 1 Q. Winter. 2 cr. Mr. Brewer.

3b. **Advanced English Composition.** 1 Q. Spring. 2 cr. Mr. Brewer.

Writing of technical papers especially adapted to the needs of technical students. Will apply in a special field the fundamentals of written and oral composition as given in English 1 and 2. In conducting the course the English department cooperates with the technical departments represented by the students who take the course.

5. **Argumentation and Forms of Public Address.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Duddy.

Principles of argumentation; briefs and debates. Some study of the forms of public address with written and oral practice. Elective for seniors, juniors, and sophomores who have credit for courses 1 and 2. At the pleasure of the instructor, sophomores who are taking course 2 may also elect course 5.

6. **Modern Drama.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite English 1. Miss McCart.

Survey of the modern drama in Europe and America, with em-

phasis on influence of Ibsen and Shaw. Elective for juniors and seniors. With the consent of the instructor it may be taken in any quarter separately.

10. **Nineteenth Century Literature.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Miss Donaldson.

Nineteenth century English literature; a study of nineteenth century prose and poetry. Reading of representative selections with particular reference to their political, social and economic setting. Lectures and class room discussions.

With the consent of the instructor this course may be taken in any quarter separately. (Not offered in 1920-1921)

11. **English Composition.** 1 Q. Autumn. 3 cr. Mr. Brewer.
For students taking the course for nurses.

14. **Contemporary Literature.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Brewer.

A reading and discussion course in contemporary English and American literature covering the period 1890-1915.

FRENCH AND SPANISH

ASSISTANT PROFESSOR, FLORENCE WALLIN

1. **French.** 3 Q. Autumn, winter and spring. Continuous.
12 cr.

Elements of grammar based on Fraser and Squairs' French Grammar, with constant practice in pronunciation, dictation and conversation. Reading of easy texts.

2. **French.** 3 Q. Autumn, winter and spring. Continuous.
12 cr.

Review of grammar. Typical fiction and dramas of the nineteenth century. Advanced composition and original theme writing. Conversation and dictation.

3. **French.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.
Study of classical and modern dramas and novels. Masterpieces of Corneille, Moliere, Racine, Rostand, Hugo and Balzac. Collateral reading and reports.

20. **Spanish.** 3 Q. Autumn, winter and spring. Continuous.
12 cr.

Elements of grammar with conversation and special emphasis on pronunciation. Reading of short stories and easy novels.

21. **Spanish.** 3 Q. Autumn, winter and spring. Continuous.
9 cr.

Reading of modern novelists and dramatists. Conversation and composition.

GEOLOGY.

ASSISTANT PROFESSOR, E. J. QUINN.

The subjects of mineralogy and geology are important not only to the student of general science, but also to those who are specializing along some particular applied line. Here the student of agriculture gains an insight into the nature of the soil as merely one particular phase of the broader subjects of rock formation, and disintegration, and from his knowledge of rocks, rock forming minerals, and the changes which these minerals undergo, gains the ability to classify soils in a systematic manner. The engineer is enabled both to distinguish between the various types of rocks and minerals, and also to foresee how a given constructive material will withstand various conditions of weathering, and other destructive agents. The science student in any field, finds in geology and mineralogy a history of the nature and origin of all the materials with which he comes in contact, and having command of such data he approaches his subject in a well prepared and intelligent manner.

The department museum, containing an excellent collection of minerals, rocks, and fossils, is constantly drawn upon for illustrative material. In addition, the publications of the United States Geological Survey are at the command of the student and are used as reference in connection with special topics.

1. **General Geology.** 1 Q. Winter or spring. 4 cr. Prerequisite Chemistry 1.

Application of the science of agriculture and engineering. Rocks and rock-forming minerals and their classification. A trip to Morrison cave, an interesting formation lying about fifty miles west of Bozeman, will be included in the field work. Lect. 4.

2. **Mineralogy.** 1 Q. Autumn or spring. 4 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4.

Chrystallography and the classification and identification of the more important minerals and rocks. Lect. 2; lab. 2.

GERMAN.

Instruction in German is suspended under the order of the State Council of Defense.

1. **Elementary German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Grammar and easy readings, with practice in speaking and writ-

ing German. Open to college students who have not had high school or preparatory German.

2. **Intermediate German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite German 1.

Modern prose, narrative and dramatic. Grammar review and elementary syntax, written and oral exercises.

3. **Advanced Freshman German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Classical and modern writers. Selected works of Schiller, Heine, Freytag, Sudermann and others. Conversation, composition and syntax. Open to freshmen who have had two years of high school German.

4. **Classics of the Eighteenth Century.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Masterpieces of Lessing, Goethe and Schiller.

5. **Modern German Dramatists.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Selected dramas of Grillparzer, Hebbel, Sudermann, Hauptmann, and others. A rapid reading course.

6. **Scientific German.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisites German 1, 2.

For students specializing in science. Rapid reading of scientific prose.

HISTORY.

ASSISTANT PROFESSOR, HELEN R. BREWER.

1. **European History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

The development of modern Europe. Use of the library with lectures on historical methods.

2. **Medieval History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Alternates with History 5.

First two quarters a text book is used; last quarter on the Italian Renaissance, topical references to the library and pictures.

5. **American History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1. Alternates with Medieval History 2.

United States history covering the period of constitutional development. Use of the library is required, and the student is expected to spend about one-fourth time in the preparation of a paper.

7. **Modern History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

Current events, a review of the political and industrial development of the last few decades.

10. **Industrial History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1.

Outlines of United States industrial history. Each quarter the student will write a paper on some special line of industry, which he either reads upon or personally investigates.

MATHEMATICS.

PROFESSOR, W. D. TALLMAN. ASSISTANT PROFESSOR, JAMES KIEFER;
INSTRUCTOR, FRIEDA BULL.

The students in this department have access to the following journals: American Journal of Mathematics (complete set); Annals of Mathematics (from 1900); Bulletin of American Mathematical Society (1898 to date); also about 200 volumes of recent treatises on mathematics. It may also be mentioned that in the engineering and physics department libraries may be found treatises and journals of applied mathematics.

1. **Engineering Mathematics.** 1 Q. Autumn or winter. 5 cr.
Mr. Tallman, Miss Bull, Mr. Kiefer.

The first three-fifths of the quarter's work is given in plane trigonometry. The remainder of the quarter is devoted to college algebra. The work of this quarter and about half of the following quarter covers a review of radicals and quadratic equations, progressions, binomial theorem, theory of limits, undetermined coefficients, infinite series, permutations and combinations, probability, and an introduction to the theory of equations.

2. **Engineering Mathematics.** 1 Q. Winter or spring. 5 cr.
Miss Bull, Mr. Kiefer.

Half of the quarter is devoted to the continuation of the algebra started in the first quarter and the remainder of the time is devoted to analytical geometry.

3. **Engineering Mathematics.** 1 Q. Autumn or spring. 5 cr.
Mr. Tallman, Miss Bull, Mr. Kiefer.

Continuation of analytical geometry and work in calculus cover-

ing "Woods & Bailey" course in mathematics, Vol I, with the exception of the last three chapters.

4. **Engineering Mathematics.** 1 Q. Autumn or winter. 4 cr. Mr. Tallman.

"Woods & Bailey" Vol. I is completed and the subjects of integral calculus, solid analytical geometry, elements of differential equations are given substantially as in Vol. II in this course and course 5.

5a. **Engineering Mathematics.** 1 Q. Winter or spring. 4 cr. Mr. Tallman.

Continuation of course 4.

5b. **Engineering Mathematics.** Spring and autumn. 4 cr. Mr. Tallman.

Continuation of course 5.

6. **Astronomy.** 1 Q. Spring. 3 cr. Prerequisites Physics 1, Mathematics 4, 5. Mr. Tallman.

Spherical astronomy with an introduction to some celestial mechanics.

8. **Trigonometry and Logarithms.** 1 Q. Autumn, spring. 4 cr. Miss Bull.

9. **College Algebra.** 1 Q. Spring. 5 cr.

Covers the ground given to algebra in Mathematics 1, 2. Miss Bull.

10. **Differential Equations.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Ordinary and partial differential equations with geometrical and mechanical applications.

11. **Partial Differential Equations of Mathematics-Physics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Course based on Weber's "Die Partielle Differential Gleichungender Mathematischen Physic," and Byerley's "Spherical Harmonics."

12. **Theory of Least Squares and Probable Error.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 5. Mr. Tallman.

13. **Statistics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite Mathematics 4. Mr. Tallman.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics.

15. **Mathematical Theory of Investments.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 2, 9 or 16. Mr. Tallman.

16. **Elementary Analysis.** 3 Q. Autumn, winter, spring. 12 cr. Mr. Tallman, Miss Bull.

A brief course in mathematics covering the fundamental princi-

ples of college algebra, trigonometry, analytical geometry and calculus designed to meet the needs of scientific students who cannot find the time to take the more extended course in these subjects found in Engineering Mathematics courses 1, 2, 3, 4, 5.

Courses 3, 4, 5, will be repeated in other quarters than scheduled if demanded by six or more students. During the fourth quarter such of the above courses will be offered only when sufficient numbers of students demand them. Should there be a demand during the fourth quarter a 12 credit course covering 2 and 3 or one covering 4 and 5 may be offered.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN JOHN P. BUBB; INSTRUCTOR, SGT. THEODORE L. BEERS.

An infantry unit, senior division, of the Reserve Officers' Training Corps has been established at this college by the President of the United States, under the provisions of the National Defense Act of 1916. The primary object is to qualify, by systematic and standard methods of training, students at civil educational institutions for reserve officers, this to be done with the least practicable interference with their civil careers. An officer of the army is detailed by the War Department as Professor of Military Science and Tactics; he also acts as Commandant of Cadets.

By law, the military course is compulsory for all physically fit male students, not aliens, during their first two years; the minimum time required is three hours per week, and satisfactory completion of the course is a prerequisite for graduation. The military course is optional for students after their sophomore year; those who elect to continue must agree in writing to continue in the Reserve Officers' Training Corps during the remainder of their course in college, to devote five hours per week to it, and to pursue the courses of camp training that may be prescribed by the Secretary of War. In consideration of this agreement the government purposes to pay the cadet so electing to continue his military studies a sum of money not to exceed the cost of the garrison ration; this is now approximately thirty cents a day. Cadets completing the four-years military course will be eligible for appointment in the army as temporary second lieutenant for six months, with a pay of \$100 per month and allowances of a regular second lieutenant. The graduate will also be eligible for appointment as a reserve officer.

The college is put to no expense for the military instruction other than proper housing for indoor drill and for government property

furnished. The government furnishes the necessary services of officers and non-commissioned officers, uniforms and equipment for the cadets.

1. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Bubb.

(a) Practical. Physical drill; infantry drill, close and extended order; gallery practice; care of rifle and equipment.

(b) Theoretical. Theory of target practice; military organization; map reading; security; hygiene.

(c) Practical. Physical drill; infantry drill; intrenchments; first aid; target practice.

(d) Theoretical. Lectures; general military policy and obligations of citizenship; service of information; combat; infantry drill; camp sanitation.

2. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Bubb.

(a) Practical. Combat firing if practicable.

(b) Theoretical. Infantry drill regulations; small-arms firing regulations; lectures as in course 1 (d); map reading; camp sanitation and camp expedients.

(c) Practical. Signaling; first aid; intrenchments, field works, obstacles, bridges, etc.; range practice.

(d) Theoretical. Lectures, recent military history; small tactical problems; marches and camps.

3. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Bubb.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Minor tactics; field orders; map maneuvers; company administration; military history.

(c) Practical. Military sketching.

(d) Theoretical. Minor tactics continued; map maneuvers; elements of international law; property accountability.

4. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Captain Bubb.

(a) Practical. Duties consistent with rank. Military sketching.

(b) Theoretical. Tactical problems, small forces, court martial proceedings; international relations of America; general principles of strategy; open to students ranking as seniors in the college.

(c) Practical. Same as (a).

(d) Theoretical. Tactical problems continued; map maneuvers; rifle in war. Lectures on military history and policy. Open to students ranking as seniors in the college.

MUSIC.

PROFESSORS, A. H. CURRIER, W. G. NASH. INSTRUCTORS, JUNE HARTMAN, L. HOWARD.

There is a universal demand that education in music shall be provided for in schools and colleges. Some knowledge of applied music is coming to be more and more a part of liberal culture and the valuable influence of good music in family and social life needs no discussion.

Accordingly the department of music offers to students of the college and others opportunity to pursue under competent instructors the main branches of music study.

Tuition is payable to the secretary of the college in advance. No reduction will be made for absence from lessons. Teachers will make up hours they fail to give according to schedule.

Non-resident students of music must be enrolled in other work, so that the total amount is equal in time spent to eighteen credits. For such students is recommended the study of home economics, languages, literature, history, and art.

The department is closed on the college and national holidays. Lessons falling on these days will not be made up.

No student is permitted to take part in any public performance without consent of the director.

Students of this department will be granted certificates, if desired, testifying to quality and amount of work done.

Recitals are given from time to time by the instructors and advanced students to which admission is free.

Music to a total of not more than six credits may be counted toward a degree in those courses which allow free electives. To those regular students who elect music the college will furnish free one thirty-minute lesson a week during the junior and senior years, or any quarter of either year; and the work may be elected in either vocal or instrumental music.

Students who enroll in two musical organizations may be given one-half credit per quarter in each, but in no case may a student exceed one credit per quarter for all musical organizations in which he is enrolled.

PIANO

The instruction in piano will comply with the special needs of each individual student, and the courses of music given them to study will be taken from the works of such standard composers as are

recognized by the leading musicians and musical institutions of the world. Specimen programs illustrating the class of music taught will be sent to anyone interested by the department. Elementary harmony is given with the piano lessons as an aid to the analysis of each piece, which is so necessary in memorizing.

Ensemble and Sight Reading

In this branch of instruction lie indispensable elements of musical knowledge and culture. Ensemble playing develops the students' ability in sight reading, and enables them to acquire an acquaintance with the masterworks of symphonic and orchestral literature, which is ordinarily inaccessible to the music student.

Theory.

Courses in harmony and musical history will be given if the demand justifies.

VOICE.

The training and development of the voice proceeds hand in hand with the acquisition of musical tastes and intelligence. Methods are adapted to individual needs. The voice is trained for correct placement, artistic tone, flexibility and agility. The possibilities of varied tone qualities for expressional purposes are emphasized and illustrated. The study of vocal technique includes the subjects of breathing, resonance, tone color, correct attack, sustained tones, scales, arpeggios, legato, staccato, embellishments. Various exercises are used. Attention is given to elegance of diction.

The cultivation of musical taste and artistic interpretation is effected by study of the best modern and classic art songs, operatic arias, and oratorio selections. The art of singing is a complex one as so much depends on the intellectual and emotional status of the singer. Hence the singer should aim to acquire general culture, appreciation of the beautiful in the world of thought and emotion as well as in the realm of sound.

VIOLIN.

The aim of the department is the acquisition of thorough technique and the study of the works of the best masters. Ensemble playing forms an important part of the course.

MUSIC TUITION.**Piano With Mr. Nash**

One half-hour lesson per week for one quarter.....	\$18.00
Two half-hour lessons per week for one quarter.....	33.00
Ensemble playing per quarter.....	7.00

Piano With Miss Hartman

One half-hour lesson per week for one quarter.....	\$15.00
Two half-hour lessons per week for one quarter.....	\$27.00

Voice With Mr. Currier.

One half-hour lesson per week for one quarter.....	\$15.00
Two half-hour lessons per week for one quarter.....	33.00

When students enter late, lessons missed will be deducted at the rate of \$1.00 per lesson.

Piano practice on the college pianos may be arranged for at the following rates:

One hour daily per quarter.....	\$4.00
Additional hour per quarter.....	3.00

PHYSICAL EDUCATION.

DIRECTOR, UNA B. HERRICK (Dean). INSTRUCTOR, LORA MAXWELL.

The aim of the physical education department for women is to develop each woman to her highest economic value as a unit of society, to the end that when she finishes her college course she may carry forth into life a sane, well balanced, logical mind, high moral character, and a strong symmetrical, properly functioning body, capable of assuming and performing cheerfully and well the duties of cultured womanhood.

Students who are relieved for any reason of the requirements in physical training, shall present four additional credits in some other subject; but the president may, at his discretion, excuse from such requirements any student in the employ of the institution.

Indoor and outdoor tennis courts and a volley ball court are furnished for the women, and beginning classes are organized; competitive games, including indoor baseball, are played between classes throughout the year.

Lectures are given on personal hygiene; general deportment for women; dress from the standpoint of health and appearance; the

physiology of bodily exercise; the useful and practical knowledge of First Aid. Each student is required to read and apply a Health Book to her personal needs, each quarter. The regulation gymnasium suit and shoes, which may be obtained through the college, will be required.

1. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body-building work, floor tactics, fundamental light apparatus work, rhythmic dancing and games, simple First Aid. Lect. 2.

2. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

The work will consist of lectures, recreational games, advanced light apparatus work, corrective gymnastics, folk and aesthetic dancing, First Aid. Lect. 2.

3. **Playground.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Maxwell.

This course will include thorough preparation in theory, methods and practice teaching in physical education. Games, playground work, corrective exercises and folk dancing. Practical experience gained by the teaching of classes in all grades of the City Public Schools and High School.

PHYSICS.

PROFESSOR, F. W. HAM. ASSISTANT PROFESSOR, J. A. KIEFER

The following courses in physics are designed to meet the needs of (1) those students who are preparing to take up some of the more technical studies in engineering, agriculture, or home economics, (2) those who expect to become physics or science teachers and (3) those general science students who wish to acquire some scientific training which is peculiar to the science of physics alone.

1. **Engineering Physics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Kiefer.

More mathematical than Physics 1a and particularly designed to meet the needs of students in engineering. Students who have not completed the calculus, mathematics 4, are required to take it during the same year that Physics 1 is taken. Lect. 3.

1a. **Agricultural Physics.** 1 Q. Spring. 6 cr. Prerequisite Mathematics 8 or its equivalent. Fee \$1; deposit \$1. Mr. Ham.

A general course with special emphasis on the fundamental prin-

ciples of physics important in the different branches of agriculture. Lect. 3; lab. 3.

2. **Physical Measurements.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee \$1; deposit \$1. Mr. Kiefer.

Laboratory course designed to supplement Physics 1. Lab. 2.

3. **Light and Sound.** 1 Q. Spring. 3 cr. Prerequisites Physics 1, 2. Mr. Kiefer.

Theory of light in its application to familiar optical phenomena and to optical instruments. The phenomena and laws of sound. Lect. 3.

4. **Physical Measurements.** 1 Q. Spring. 2 cr. Fee \$1; deposit \$1. Mr. Kiefer.

Laboratory course in light and sound to supplement Physics 3. Lab. 2.

5. **Electricity and Magnetism.** 2 Q. Autumn and winter. 6 cr. Prerequisites Physics 1, 2, Mathematics 4. Fee \$1; deposit \$1. Mr. Ham.

Methods for the exact measurements of resistance electro-motive force, current, capacity, and the co-efficient of self induction. Calibration of commercial instruments, insulation testing, and magnetic measurements. Lect. 2; lab. 1. Lect. 1; lab. 2.

6d. **Pedagogy of Physics.** 1 Q. Spring. 4 cr. Prerequisites Physics 1, 2, 3, 4. Mr. Ham.

Methods of teaching, the selection and performance of effective lecture table and laboratory experiments and practice on presenting the topics covering such experiments to elementary and college classes. Lect. 4.

9. **Household Physics.** 1 Q. Spring. 5 cr. Fee \$1; deposit \$1. Mr. Ham.

A general course including the physics of ventilation, the lighting and heating of houses and other physical phenomena of interest to the housekeeper. Lect. 2; lab. 3.

10. **Meteorology.** 1 Q. Spring. 4 cr. Mr. Ham.

Sources and measurements of atmospheric temperature, pressure and circulation of the atmosphere, measurement and movement of moisture, cause and prevention of frost. Part of the course will consist of a study of Montana weather bulletins. Lect. 4.

11. **Electron Theory.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 10 credits of College Physics. Mr. Ham.

Graduate course open to undergraduates who can satisfy the pre-

requisites. Not a survey course but a discussion of recent research work. Lect. 3.

14. **General Physics.** 2 Q. Winter and spring. 8 or 10 cr. Prerequisite Mathematics 16. Fee \$1; deposit \$1. Mr. Ham.

A course for students desiring a general knowledge of physics either in connection with the other sciences or as a matter of general education. The course will consist of a general survey of mechanics, heat, light, electricity, and magnetism, and sound and will be less mathematical than the technical courses in physics.

Lecture demonstrations will be numerous and the student will be given an opportunity to test many of the laws for himself in the laboratory. Lect. 2; lab. 2; lect. 3; lab. 2.

16. **Advanced Heat.** Autumn. 4 cr. Prerequisites Physics 1 and 2 or 14. Fee \$1; deposit \$1. Mr. Ham.

A continuation of the study of the laws of heat begun in Course 1. Special attention will be given to methods of heat transmission, thermometry, specific heats and the laws of thermodynamics. Lect. 3; lab. 1.

Secondary Schools

The secondary schools offer the following courses:

1. School of Agriculture; 2. School of Home Economics; 3. School of Mechanic Arts. These courses continue through a period of three years of six months each.

School of Agriculture

The School of Agriculture offers practical instruction to the young men from the farms of Montana who wish to fit themselves for successful farming. The courses offered are intended as a preparation for life rather than for college. The student is brought into actual contact with the problems connected with the farm and learns that agriculture is a profession requiring both skill and knowledge.

Students in this school have the privilege of studying a modern dairy in operation, including types of the best breeds of dairy cattle; a complete poultry plant in operation, containing breeds illustrating especially the best laying strains and market fowls; modern grain and soil laboratories; model farm buildings and barns, with pure bred livestock; the experiment station farm; greenhouse and orchards; and the large biological, chemical and physical laboratories, and well-equipped wood and iron shops of the engineering college.

The variety of animals included upon the farm affords ample opportunity to see the various diseases, injuries, etc., encountered in farm animals. In the veterinary building, there is provided a clinic room, where the sick and injured animals are treated, and the student is given the benefits of these demonstrations.

The course extends through three years of six months each and comes in the winter season when the young men can be spared from farm work. For admission to this school, students must have passed the eighth grade or its equivalent, or give satisfactory evidence to the principal of the school that they are capable of carrying on the work. Young men twenty-one years of age or over will be admitted to the course without having completed the eighth grade provided they have had some practical experience on the farm and possess a fair common school education. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF AGRICULTURE

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a)	4	4
Elementary Physics (Phys. b)	5	
Mechanical Drawing (M. A. k)	2	2
Plant Propagation and Tree Planting (Hort. a)	4	
Common Diseases (Vet. Sci. a).....		4
Carpentry (M. A. a)	2	2
Animal Types ^e (An. Husb. a and b)	2	2
Military Science (Mil. Sci. a)	1	1
Optional		
Industrial Arithmetic (Math. f) or		
Farm Machinery, 3 cr., (Agron. e) and		
Irrigation and Drainage, 2 cr., (Agron. f) or.....		5
Vegetable Gardening and Small Fruit Culture, 3 cr., (Hort. b) and		
Irrigation and Drainage, 2 cr., (Agron. f).....		5

SECOND YEAR

English Composition (Eng. b)	2	2
Elementary Chemistry (Chem. a)		5
Soils and Crops (Agron. a, b)	6	6
Breed Types (An. Husb. c, d).....	2	2
Farm Dairy (Dairy a)	3	3
Forge (M. A. b)	2	2
Farm Poultry (Poultry a)	4	
Military Science (Mil. Sci. b).....	1	1

THIRD YEAR

Composition and Literature (Eng. c)	2	2
Farm Management and Accounts (Agron. d).....	2	2
Plant Diseases (Bot. a)		3
Animal Breeding (An. Husb. g)	3	
Agricultural Economics (Econ. a)	3	
Rural Sociology (Soc. b)		3
Farm Motors (M. A. s)	3	
Insects Pests (Entom. a)	3	
Principles of Feeding (An. Husb. e)	2	
Feeding and Management of Livestock (An. Husb f).....		4
Military Science (Mil. Sci. c)	1	1

School of Home Economics

The School of Home Economics is designed especially to fit young women to become home builders. The well equipped laboratories, kitchens, sewing rooms, dairy, greenhouses, etc., are admirably fitted for making instruction intensely practical.

The entrance requirement of the three-years course is the completion of the eighth grade in the common schools or the equivalent. The young women who do not continue their studies have a practical training which fits them for home making, and which furnishes an excellent preliminary training for the vocations based upon domestic science and art.

The course extends through three years of six months each. Those who satisfactorily complete the course will be given certificates.

COURSE IN THE SCHOOL OF HOME ECONOMICS

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a)	4	4
Textiles (H. E. c)	2	
Garment Making (H. E. a).....	2	4
Drawing (Art a).....	2	2
Cooking (H. E. g).....	4	4
Industrial Arithmetic (Math. f).....	4	
Home Gardening (Hort. d)		3
Physical Education (Phys. Ed. a)	1	1

SECOND YEAR

English Composition (Eng. b)	2	2
Cooking (H. E. e)	4	4
Dressmaking (H. E. b)	3	4
Household Sanitation (H. E. k).....	3	
Chemistry (Chem. a)		5
Elective	8	4
Physical Education (Phys. Ed. b)	1	1

THIRD YEAR

Composition and Literature (Eng. c).....	2	2
House Planning and Decoration (H. E. m).....	3	
Home Dairying (Dairy c).....		3
Home Nursing (H. E. f)	2	
Household Management (H. E. j).....		4
Foods (H. E. h)	2	2
Dressmaking (H. E. d)	2	2
Elective	8	6
Physical Education (Phys. Ed. c)	1	1

Note—Electives and options must be selected subject to the approval of the principal of the secondary schools.

School of Mechanic Arts

The courses in Mechanic Arts are planned for young men who desire to follow the mechanical trades, but who realize that some instruction in mathematics, science, and drawing should accompany the shop training in order to make men qualified to become intelligent mechanics. The courses are not designed to make journeyman mechanics, but rather to give a foundation which must be supplemented by further experience in industry. The instruction is given by the regular faculty members using the college laboratories, drawing rooms, and shops.

For admission to this course the equivalent of an eighth grade certificate is required. Applicants must be sixteen years of age or over. Students whose previous school work has given them the equivalent of any of the courses will be given more advanced training. The shop instruction is based on two general lines, either the option in general machine work or that in automobile repair work.

COURSE IN MECHANIC ARTS

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a)	4	4
Algebra (Math. a)	4	4
Mechanical Drawing (M. A. m).....	2	2
Forging (M. A. b)	2	2
Military Science (M. S. a)	1	1
Machine Work Option (M. A. f) or	6	6
Automobile Option (Auto Repair M. A. j).....	6	6

SECOND YEAR

English Composition (Eng. b)	2	2
Geometry (Math. c)	4	4
Elementary Physics (Phys. c)	4	4
Mechanical Drawing (M. A. n)	2	2
Military Science (Mil. Sci. b).....	1	1
Machine Work Option:		
Pattern Making (M. A. e)	2	
Foundry Work (M. A. d).....		2
Machine Work (M. A. h)	6	6
Automobile Option:		
Machine Work (M. A. g)	2	2
Automobile Mechanics (M. A. j1)	6	6

Courses of Instruction

AGRONOMY.

PROFESSOR, P. V. CARDON. ASSISTANT PROFESSORS, E. L. CURRIER, H. E. MURDOCK, H. R. SUMNER.

a. Crops and Soils. 1 Q. Autumn. 6 cr. Mr. Sumner.

How plants grow, fundamental features of plant growth, soil as a factor in plant growth; elementary soil studies; soil types, structure, soil water, soil temperature, moisture, conservation, tillage methods, acid and alkali soils; cereal production; practical studies of wheat, barley, oats, corn, and other cereals. Their production on dry and irrigated farms. Grain judging and the market classes of grain. Lect. 3; lab. 3.

b. Crops and Soils. 1 Q. Winter. 6 cr. Prerequisite Agronomy a. Mr. Sumner.

A continuation of the studies in Agronomy a. Management and care of meadows and pastures. Hays and hay making forage crops for Montana; the production and handling of alfalfa, clovers, grasses, sorghums, and other forage crops. Lect. 4; lab. 2.

d. Farm Management and Accounts. 1 Q. Winter. 4 cr. Mr. Currier.

Fundamental principles involved in the successful organization and management of a farm are considered. Lect. 2; lab. 1.

e. Farm Machinery. 1 Q. Winter. 3 cr. Prerequisites Physics b. Mr. Murdock.

Study of the various types of farm machinery. Selection, adjustment and care of farm machinery. Modern farm conveniences, such as telephones, water supply systems, etc. Lect. 2; lab. 1.

f. Irrigation and Drainage. 1 Q. Winter. 2 cr. Prerequisite Physics b. Mr. Murdock.

Methods of irrigating and draining land. Lect. 1; lab. 1.

ANIMAL HUSBANDRY

PROFESSOR, ————. ASSISTANT PROFESSOR, R. C. McCHORD,
INSTRUCTOR, O. TRETSVEN.

a. Animal Types. 1 Q. Autumn. 2 cr. Fee \$1. Mr. Tretsven.
Market types of cattle and sheep. Lab. 2.

b. Animal Types. 1 Q. Winter. 2 cr. Fee \$1. Mr. Tretsven.
Judging of market types of dairy cattle, horses and swine.
Lab. 2.

c. Breed Types. 1 Q. Autumn. 2 cr. Fee \$1. Prerequisites
Animal Husbandry a, b. Mr. McChord.

Breed types of cattle and sheep. Lect 1; lab 1.

d. Breed Types. 1 Q. Winter. 2 cr. Prerequisites Animal
Husbandry a, b. Mr. McChord.

Breed types of dairy cattle, horses, and swine. Lab. 2.

e. Principles of Feeding. 1 Q. Autumn. 2 cr. Fee \$2. Mr.
Tretsven.

A study of the nutrients and their functions, digestion, feeding
standards, compounding rations, feeds and their adaptability.

f. Feeding and Management of Live Stock. 1 Q. Winter. 4 cr.
Prerequisites Animal Husbandry e. Fee \$2. Mr. Tretsven.

The feeding, care, and management of horses, dairy cattle, beef
cattle, sheep, and swine. Lect. 3; lab. 1.

g. Animal Breeding. 1 Q. Autumn. 3 cr. Prerequisites Ani-
mal Husbandry c, d. Mr. McChord.

Principles of breeding as directly applied to the farm. Cross
breeding, inbreeding, and line breeding. Lect. 2; lab. 1.

ART.

PROFESSOR, LANA BALDWIN. INSTRUCTOR, MURIEL MOORE.

a. Drawing. 2 Q. Autumn and winter. 4 cr. Fee \$.50. Miss
Moore.

Freehand drawing from geometric solids and casts. Study of
light and shade. Object drawing, in charcoal, pencil, pen and ink.
Study of linear perspective with practical exercises in perspective
sketching. Lab. 2.

b. Drawing. 2 Q. Autumn and winter. Fee \$.50. Miss Moore.
Continuation of course a, with study of design nad handicraft.
Lab. 2.

BOTANY AND BACTERIOLOGY.

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON

a. **Plant Diseases.** 1 Q. Winter. 3 cr. Fee \$1. Mr. Jennison.

A study of the importance, symptoms, and methods of control of the more important diseases of plants. Lect. 2; lab. 1.

CHEMISTRY.

PROFESSOR, W. M. COBLEIGH.

a. **Elementary Chemistry.** 1 Q. Winter. 5 cr. Fee \$4; deposit \$4.

Lectures with experimental illustrations, and recitations on general elementary chemistry. Special emphasis will be given to the applications of the science to daily life and to agriculture. Lect. 3; lab. 2.

DAIRY HUSBANDRY.

PROFESSOR, G. L. MARTIN.

a. **Farm Dairying.** 2 Q. Autumn and winter. 6 cr. Fee \$2; deposit \$1.

Dairy problems as applied to building up the dairy herd, care and management of the herd, and marketing dairy products. Applications of the Babcock test, and operation of hand separators. Lect. 2; lab. 1.

b. **Dairy Management.** 1 Q. Winter. 3 cr. Fee \$1; deposit \$1.

Factors influencing the secretion, composition and properties of milk, care, and handling of milk and cream; hand separators, cooling vats, grading, sampling and testing milk and cream; making butter and cheese on the farm, and marketing dairy products. Lect. 2; lab. 1.

c. **Home Dairy.** 1 Q. Winter. 3 cr. Fee \$1; deposit \$1.

Composition, properties and uses of milk and its products, care and handling, fermentations, adulterations, modifications, ripening of cream for butter making. Manipulation of tests, manufacture of butter, cheese and frozen products. Lect. 2; lab. 1.

d. **Dairy Manufactures.** 1 Q. Winter. 3 cr. Fee \$1; deposit \$1.

Factory methods of making butter, cheese, and frozen products;

scoring and preparing them for market. Factory management and dairy accounts. Lect. 2; lab. 1.

e. **Advanced Judging of Dairy Cattle.** 1 Q. Autumn. 2 cr.

The advanced judging of dairy cattle will include practice work and trips to dairy farms. Lect. 1; lab. 1.

ECONOMICS AND SOCIOLOGY.

PROFESSOR, J. M. HAMILTON.

a. **Agricultural Economics.** 1 Q. Autumn. 3 cr.

A study of such agricultural economic problems as the value and rent of land, farm labor, rural credit, cooperative buying and selling. Lect. 3.

b. **Rural Sociology.** 1 Q. Winter. 3 cr.

The social problems of the open country, rural health and sanitation, the country church, the rural school, the means of communication and transportation, libraries and recreations. Lect. 3.

ENGLISH.

PROFESSOR, J. H. HOLST.

a. **English Exercises.** 2 Q. Autumn and winter. 8 cr. Mr. Holst, Miss Donaldson.

Practice in spelling, punctuation, note taking, letter writing and the simpler forms of composition. Lect. 4.

b. **English Composition.** 2 Q. Autumn and winter. 4 cr. Mr. Holst.

The paragraph and its development; the news item and short news story; business forms; practice in oral and written composition.

c. **Composition and Literature.** 2 Q. Autumn and winter. 4 cr. Mr. Holst.

Oral and written exercises in narration, description, exposition, and argumentation; current literature, use of the library.

d. **Parliamentary Law.** 1 Q. Winter. 2 cr. Mr. Holst.

The principles of parliamentary law, the conduct of meetings, the organization of a society, the duties of officers, the recording of proceedings. The students will be given drill and actual practice. Lect. 2.

ENTOMOLOGY AND ZOOLOGY.

PROFESSOR, R. A. COOLEY.

- a. **Insect Pests.** 1 Q. Winter. 3 cr. Mr. Cooley.

Consideration of the more important insect pests of Montana and the means of their control. Lect. 3.

HOME ECONOMICS.

PROFESSOR, ALBA BALES. ASSISTANT PROFESSORS, CARLOTTA FORD, EMMA GARRISON. INSTRUCTOR, LAURA RANDALL.

- a. **Garment Making.** 2 Q. Autumn and winter. 6 cr. Fee \$1. Miss Randall.

Fundamental principles of hand and machine sewing applied to the making of aprons and undergarments. Students provide suitable materials. The finished work is the property of the student. Lab. 2 or 4.

- b. **Dressmaking.** 2 Q. Autumn and winter. 7 cr. Fee \$1. Miss Garrison.

Designing, cutting and making simple dresses.

- c. **Textiles.** 1 Q. Autumn. 2 cr. Fee \$1.50. Miss Garrison.

Study of cotton, wool, silk, and linen, in regard to its microscopical structure, physical properties, manner of growth, and manufacture into cloth. Simple tests for adulteration. Lect. 1; lab. 1.

- d. **Dressmaking.** 2 Q. Autumn and winter. 4 cr. Fee \$.50. Miss Garrison.

- e. **Cooking.** 2 Q. Autumn and winter. 4 cr. Fee \$2. Miss Ford. Lab. 2.

- f. **Home Nursing.** 1 Q. Autumn. 2 cr. Miss Ford.

Care of sick, making beds, bathing, bandaging, emergencies, etc. Lect. 1; lab. 1.

- g. **Cooking.** 2 Q. Autumn and winter. 8 cr. Fee \$3. Miss Ford.

Plain cooking, such as breads, meats, eggs, cereals, soups, salads, preserving fruits, cakes, candy and simple dessert. Visits to the meat market to study cuts of meat. Students are shown how biology and chemistry apply to the preparation of foods. Lect. 2; lab. 2.

- h. **Foods.** 2 Q. Autumn and winter. 4 cr. Fee \$2.50. Miss Ford.

General principles of human nutrition. Some attention is given to invalid cookery. Lab. 2.

j. **Household Management.** 1 Q. Winter. 4 cr. Fee \$.50. Miss Randall

Expenditure of income furnishing with reference to economy and efficiency, also the working out of a number of home problems by each member of the class. Lect. 3; lab. 1.

k. **Household Sanitation.** 1 Q. Autumn. 3 cr. Miss Randall.

Care of the home from a sanitary standpoint. Source of water supply, and preservation of food. Lect. 2; lab. 1.

m. **House Planning and Decoration.** 1 Q. Autumn. 2 cr. Miss Randall. Lect. 1; lab. 2.

HORTICULTURE.

PROFESSOR, ————. ASSISTANT PROFESSOR, C. C. STARRING.

a. **Plant Propagation and Tree Planting.** 1 Q. Autumn. 4 cr. Fee \$1. Mr. Starring.

Plant propagation with special reference to the methods of multiplying fruit and planting of trees. The latter part of the course deals with simple principles of ornamental planting and ornamental plants, and the growing of trees adapted to Montana conditions. Lect. 4.

b. **Vegetable Gardening and Small Fruit Culture.** 1 Q. Winter. 3 cr. Mr. Starring.

Methods of growing, gathering, storing, and marketing the more important vegetable crops; hot bed construction and management; and the growing of such small fruits as the strawberry, raspberry, blackberry, currants, and gooseberry. Lect. 3.

c. **Fruit Growing.** 1 Q. Autumn. 3 cr. Prerequisite Horticulture a. Mr. Starring.

Selecting sites, planning and planting, cultivation, irrigation, pruning, and general care of the orchard, more especially from the standpoint of the home orchard. Lect. 3.

d. **Home Gardening.** 1 Q. Winter. 3 cr. Mr. Starring.

Elementary course dealing with the principles of plant propagation, vegetable gardening, small fruit culture, and ornamental gardening. Lect. 3.

MATHEMATICS.

PROFESSOR, W. D. TALLMAN. INSTRUCTOR, FRIEDA BULL.

a. **Algebra.** 2 Q. Autumn and winter. 8 cr. Miss Bull. Lect. 4.

b. **Advanced Algebra.** 1 Q. Autumn. 4 cr. Miss Bull.

Simultaneous quadratic equations, graphical representations of

simple equations in two variables; theory of indices, (positive, negative, fractional, zero) radicals, etc. Lect. 4.

ite Mathematics a. Mr. Tallman.

c. **Plane Geometry.** 2 Q. Autumn and winter. 8 cr. Prerequisite Mathematics a. Mr. Tallman.

This includes in addition to the work given in the standard texts, a large number of original exercises. Lect. 4.

d. **Solid Geometry.** 1 Q. Spring. 4 cr. Prerequisite Mathematics b, c. Mr. Tallman.

This course covers ordinary work in solid geometry with special attention to the geometry of the sphere. Lect. 4.

e. **Shop Arithmetic.** 2 Q. Autumn and winter. 8 cr. Miss Bull.

Designed to develop skill and accuracy in the fundamental processes of arithmetic. Problems will be chosen very largely of the type the student will actually encounter in connection with his mechanical work. Lect. 4.

f. **Industrial Arithmetic.** 1 Q. Autumn. 5 cr. Miss Bull.

Fundamental processes of arithmetic related to home and farm experience. Mathematical problems connected with the work of the shop and laboratory. Lect. 4.

MECHANIC ARTS.

PROFESSOR, E. B. NORRIS, (Dean). ASSISTANT PROFESSOR, R. T. CHALLENGER. INSTRUCTORS, F. C. HOMANN, F. W. KATELY, ALFRED LUDWIG.

a. **Wood Work.** 2 Q. Autumn and winter. 4 cr. Fee \$2; deposit \$2. Mr. Challenger.

Handtools used in carpentry, their care and use; practical applications in the making of practical objects for the home, farm, and shop; barn and house framing. Lab. 2.

b. **Forge.** 2 Q. Autumn and winter. 4 cr. Fee \$2; deposit \$2. Mr. Kately

Care and manipulation of fire, forging, including the operation of drawing, upsetting, pointing, bending, welding, calculation of stock; implement repairs; plow pointing; manufacture of chains, hooks, clevises, etc. Lab. 2.

d. **Foundry.** 1 Q. Winter. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Bench and floor molding in green sand. Castings in white metal, brass, and cast iron are poured for use in the machine shop. Lab. 2.

e. **Pattern Making.** 1 Q. Autumn. 2 cr. Fee \$2; deposit \$2. Mr. Challenger.

Allowances on pattern for draft, shrinkage and finish; construction of patterns for pulleys, hangars, machine parts and pipe fittings, and the necessary core boxes. Lab. 2.

f. **Machine Work.** 2 Q. Autumn and winter. 12 cr. Fee \$4; deposit \$4. Mr. Homann.

Bench work, including chipping, filing, scraping and fitting; machine tool work on drill press, shaper, planer and lathe. Lab. 6.

g. **Machine Work.** 2 Q. Autumn and winter. 4 cr. Fee \$2; deposit \$2. Mr. Homann.

Chipping and filing; bench work in iron; simple machine work. Lab. 2.

h. **Machine Work.** 2 Q. Autumn and winter. 12 cr. Fee \$4; deposit \$4. Mr. Homann.

General machine work on drilling machines, shaper, planer, lathe, and milling machine. Lab. 6.

j. **Automobile Repair.** 2 Q. Autumn and winter. 12 cr. Fee \$4; deposit \$4. Mr. Homann.

Construction and repair of the automobile. Lect. 1; lab. 5.

jl. **Automobile Mechanics.** 2 Q. Autumn and winter. 12 cr. Fee \$4; deposit \$4. Mr. Homann.

A continuation of course j with advanced work in adjusting the various makes of carburetors and ignition systems; locating trouble, and repair work; overhauling various makes of starting and lighting systems and storage batteries. Lect. 1; lab. 5.

k. **Mechanical Drawing.** 2 Q. Autumn and winter. 4 cr. Mr. Challenger.

Elements of lettering; geometrical construction; isometric and orthographic representations; working drawings; farm building construction; bills of material; farm maps. Lab. 2.

m. **Mechanical Drawing.** 2 Q. Autumn and winter. 4 cr. Mr. Ludwig.

Lettering; geometrical construction; freehand sketching of simple machine parts, reproduced in detailed working drawings; orthographic projection. Lab. 2.

n. **Mechanical Drawing.** 2 Q. Autumn and winter. 4 cr. Mr. Ludwig.

Machine detail drawing; sections; assemblies; tracing and blue printing; isometric and cabinet projection; intersections and developments of surfaces with application in roof framing and sheet metal work. Lab. 2.

s. **Farm Motors.** 1 Q. Auutmn. 3 cr. Fee \$2. Mr. Homann.

Motors adapted for use on the farm, particularly the gas engine, with practice in operating and locating troubles. Tractor practice and simple stationary installations. Lect. 2; lab. 2.

MILITARY SCIENCE.

PROFESSOR, CAPTAIN JOHN P. BUBB. INSTRUCTOR, SGT. THEODORE L. BEERS.

- a. Military Science. 2 Q. Autumn and winter. 2 cr.

Refer to military science courses in the college for a description of this work, and the courses that follow.

- b. Military Science. 2 Q. Autumn and winter. 2 cr.

- c. Military Science. 2 Q. Autumn and winter. 2 cr.

PHYSICAL EDUCATION.

MRS. UNA B. HERRICK, (Dean). INSTRUCTOR, LAURA MAXWELL.

- a. Physical Education. 2 Q. Autumn and winter. 2 cr.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body building work, some floor tactics. Rhythmic dancing and games. Class exercises 2.

- b. Physical Education. 2 Q. Autumn and winter. 2 cr.

Athletics. Tennis, volley ball, basketball, indoor baseball, and recreational games, lectures and exercises.

- c. Physical Education. 2 Q. Autumn and winter. 2 cr.

Folk dancing. Recreational games. Class exercises 2.

PHYSICS

PROFESSOR F. W. HAM. ASSISTANT PROFESSOR, J. A. KIEFER

- a. Elementary Physics. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Mr. Ham. Fee \$1; deposit \$1.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound, heat, light, electricity and magnetism Lect. 3; lab. 1.

- b. Elementary Physics. 1 Q. Autumn. 5 cr. Mr. Ham.

Experimental lectures, recitations, and assigned problems on mechanics, heat, light and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture. Lect. 5.

- c. Elementary Physics. 2 Q. Autumn and winter. 8 cr. Fee \$1; deposit \$1. Mr. Ham.

POULTRY HUSBANDRY.

PROFESSOR, W. F. SCHOPPE.

a. Farm Poultry. 1 Q. Autumn. 4 cr.

Various breeds and their adaptability to farm use. Housing, feeding, incubation and brooding. Judging birds, operating incubators and brooders. Lect. 3; lab. 1.

VETERINARY SCIENCE.

PROFESSOR, H. WELCH.

a. Common Diseases of Animals. 1 Q. Winter. 4 cr.

A course for the stock grower, illustrating methods of diagnosis and treatment of the common ailments of domestic animals. First aid treatment of wounds and injuries; a brief course of instruction in obstetrical work and methods of handling cases of difficult parturition. Each division of the course is illustrated by actual cases as far as possible.

b. Infectious Diseases of Animals. 1 Q. Winter. 2 cr. Pre-requisite Veterinary Science a.

A course dealing with the more important and common infectious diseases of animals. Diagnosis, methods of prevention, quarantine regulations, and disease eradication methods.

Summer Quarter

GENERAL INFORMATION.

THE PLAN.

The wonderful development of the work of the land grant colleges during the last quarter of a century has given them a position of leadership in education. This leadership is finding expression through instruction, experimentation, and extension. The importance of the work demands the operation of the entire plant and working force throughout the year, and therefore, the summer session is not merely an additional means but rather an integral part of a great plan.

Those who find it more convenient to attend during the summer may avail themselves of all the opportunities offered during the regular college year. In fact, the experiment plots, gardens, orchards, and livestock are seen at their best during the summer, while the shops, laboratories and libraries are fully available.

The summer session is divided into two sessions of six and five weeks respectively. The second term will offer only the regular courses required by the men who are attending the college under the Federal Board for Vocational Education, but others are admitted to the classes.

WHO SHOULD ATTEND.

Under the present organization of public education in Montana, every public school and high school in the state is either directly or indirectly linked up with the College of Agriculture and Mechanic Arts in its work on the campus or through its extension activities. The highest aims can be achieved only through coordination of plans and cooperation in effort.

Many teachers are coming to the state who could best adjust themselves to the needs of the educational work in the state by attendance at the Summer Session.

Superintendents and principals who must deal with the problems of agricultural and vocational education should find courses suited to their needs.

Teachers in service, instructors in the practical and vocational

arts and sciences, need the contact with the institution which operates in that field.

County superintendents who are ever coming in closer contact with the problems of industrial education will find courses adapted to their needs.

Rural teachers and teachers in rural consolidated schools should be especially attracted to the College of Agriculture and Mechanic Arts.

Courses will also be offered for teachers in part-time and trade schools.

College students may make up deficiencies, or shorten the time of attendance required for graduation, by attending Summer Session.

COURSES OFFERED

Courses representative of the various departments of the college will be offered. These courses, in most instances, are selected from the work of the regular college year, and are equal in character and amount to the regular work. A number of special courses are offered in vocational education.

Since either term of the summer session is only half the length of a regular college quarter, the number of recitations and amount of work per week for each credit will be approximately twice that required each week during the college year. Nine quarter credits constitute standard work.

One hour a week for a quarter, of recitation or lecture work, two or two and one-half hours a week for a quarter of laboratory, shop, library work, or drawing, shall count as one credit.

ADMISSION TO COLLEGE WORK.

Applicants for admission must be at least sixteen years of age and must present evidence of good moral character.

Graduates of the accredited high schools of Montana obtain admission by presenting certificates of principals stating subjects taken, time given to each, and grades obtained. Blanks for such certificates are furnished by the registrar. These should be secured, filled out and filed in the registrar's office on or before the first day of registration. Preparatory work done in other schools than those accredited may receive credit. Applicants from such schools should present certificates stating the same points as those given from accredited schools. Blanks for this purpose are furnished by the registrar. When the evidence is not clear and satisfactory, examinations will be given.

Graduates of high schools not in Montana are admitted on cer-

tificates without examination, if such high schools are accredited to their own state universities.

ADMISSION OF SPECIAL STUDENTS

Students eighteen years of age or older, not candidates for degrees, may be admitted without the usual entrance units, or special students, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired. Special students may acquire status as regular students and become candidates for degrees upon complying with the rules for admission and graduation.

STANDARDS FOR TEACHERS' CERTIFICATE CREDIT

Standards for credits accepted on Teachers' Certificates established for Summer Schools and the institutions of the University of Montana, and jointly adopted by the executives of the University of Montana and the State Board of Educational examiners on January 16, 1920, to be effective on and after June 7, 1920. No certificate credits obtained prior to that date will be altered by these provisions.

A. Regulations for those seeking credits on certificate subjects, but not seeking to meet the legal requirements for twelve weeks of normal training as set forth in Chapter 114, Session Laws of 1917.

(1). Before taking courses accepted for credit on second grade teachers' certificates at Montana summer schools and at any of the institutions of the University of Montana, candidates must have had a minimum of two years of high school training or its equivalent.

(2). Before taking courses accepted for credit on first grade teachers' certificates at Montana summer schools and at any of the institutions of the University of Montana, candidates must have had a minimum of three years of high school training or its equivalent.

(3). Before taking courses accepted for credit on professional grade certificates, candidates must be graduates from an accredited high school or have had an equivalent preparation.

(4). Equivalent preparation shall be determined in the several institutions of the University of Montana by the administrative machinery which now exists for the determination of entrance and advanced standing credits of all students therein; but teaching experience shall not be counted as academic preparation. In the summer schools not under the control of the University of Montana "equivalent preparation" shall be determined under rules and regulations fixed by the superintendent of public instruction.

(5). Certificate subjects shall be measured in terms of hours of classroom work of approximately sixty minutes each, with an average preparation of one hour and thirty minutes. In summer schools

under the jurisdiction of the superintendent of public instruction subjects other than certificate subjects shall meet the same requirements. The minimum number of class room hours for each certificate subject shall be as follows:

Reading	45	American Literature	45
Writing	15	Physical Geography	45
Arithmetic	45	Elementary Psychology	45
Spelling	15	School Management	30
Grammar	45	School Law	15
Geography	45	Educational Psychology	45
Physiology and Hygiene	30	Principles of Education.....	45
U. S. History	45	English Literature	45
Civics	45	History of Education.....	45
Theory and Art	45	General History	45
Agriculture	45		

(6) Fifteen or sixteen hours of classroom work will constitute a normal weekly program. Students of exceptional ability may with the approval of the faculty of the school be permitted to carry a maximum of nineteen hours of class work per week.

Excessive class registration which necessarily limits the quality of the work may be deemed sufficient ground for withholding certificate credit. No certificate credit will be recognized if earned in a class enrolling more than forty students unless it can be shown that such class was conducted by a teacher of superior ability and under favorable conditions.

(7) The same standards shall also apply to the credits obtained thru correspondence courses which are completed after June 7, 1920.

B. Standards for those seeking to meet the legal requirement of twelve weeks of normal training as set forth in Chapter 114, Session Laws of 1917.

(1) Students must have a minimum academic preparation of two years of high school work or its equivalent as stipulated in Chapter 114, Session Laws 1917, Section 5.

(2) Such students must carry 15 quarter hours of credit and do passing work in at least 12 quarter hours. One quarter hour of credit shall be understood to mean two and one-half hours in class and preparation (as fixed under A (5) above) carried through twelve weeks; or an equivalent time spent in class and preparation.

(3) Such students shall also conform to the other standards set forth in A (5) and (6) above.

(4) Sixty per cent of the work in the "twelve weeks of normal training" shall be in the above certificate subjects.

THE ROUND TABLE.

The round table discussions, which have been an interesting feature of the Agricultural College Summer Sessions, will be continued. At least three hours each week will be provided for the round table. Rural problems of general interest will be considered under the direction of capable leaders, selected from the faculty and students.

THE CONFERENCE HOUR.

The faculty of the Summer Session will be men and women in intimate touch with rural problems. Several members are prominent leaders in rural school work, and they will appoint one hour each day for individual conferences. Experience has shown that many teachers welcome such an opportunity for direct personal assistance.

GENERAL ASSEMBLY.

A general assembly will be held for twenty minutes each morning. This time will be given to announcements and to singing under the direction of the leader in community singing. A general assembly will also be held at 11 o'clock on Friday of each week, at which time visiting lecturers will be heard.

TEACHERS' APPOINTMENT COMMITTEE.

The Summer Session will maintain an appointment committee to assist teachers in securing positions. The services of the committee are free to students and school officers.

LIBRARY.

The college library will be open throughout the Summer Session and extensive classified list of bulletins, conveniently arranged, will be available for reading and reference. The attention of the rural teacher will be called to the vast amount of valuable information in bulletin form for free distribution, and directions and plans for its use will be given.

RECREATION.

Students will have the use of the college tennis courts and gymnasium. Outdoor games in which all are invited to take part will be encouraged and competent direction will be provided.

Week-end excursions will be made to beautiful Bridger canyon and the United States fish hatchery, to a highly developed rural

community with its school and church, and industrial and social organization, and to other places of interest.

The mountains, canyons and trout streams near Bozeman invite to wholesome recreation during recess from work.

EXCURSION THROUGH YELLOWSTONE PARK.

At the close of the session, the fifth annual excursion through the Yellowstone National Park will be made. From thirty to fifty teachers take advantage of this excursion every year, and it is accounted one of the most pleasant and profitable features of the session. Five days are spent in the Wonderland of America. The conveyances and accommodations are first class and the total expense low.

Further information about the trip through the park will be furnished on application to the Director of the Summer Session.

REGISTRATION

A registration fee of \$10.00 is required of all students. Any single course may be taken for a fee of \$5.00 and the laboratory fee, if there be any in connection with the course taken. Those taking a single course will not be entitled to any refund of railroad fare.

BOARD AND ROOM AT HAMILTON HALL

Board and room at Hamilton Hall will cost \$54.00 for the session, or \$9.00 per week in advance in both cases. Hamilton Hall is a delightful home for college women, and the members of the Summer Session should look forward with pleasant anticipation to life there. Hamilton Hall will be ready for occupancy on the afternoon of June 20. A deposit of \$5.00 to apply on board should be sent in advance for a reservation.

THE BARRACKS

Board and room for men will be furnished at the new barracks at \$40.00 for the session of six weeks. Board alone for men and women will be \$5.50 a week or \$30.00 for the session.

The Barracks are commodious and well equipped buildings, located on the campus. They will be ready for occupancy June 20. A deposit of \$5.00 to apply on board should be sent in advance for a reservation.

RAILROAD FARE REFUND

Each regularly enrolled student who completes satisfactorily six quarter credits, or the equivalent, of regular work for at least

one term during the summer quarter will be entitled to receive at the close of either term of the quarter, or as soon thereafter as possible, a refund of five dollars. The amount of the refund will be based upon the railroad fare over the cheapest route. This refund cannot be made to students coming from other states, nor to those who do not secure official receipts for the fare paid, and no further refund will be made to any student for whom a refund has already been allowed during the current year.

While every reasonable effort will be made by administrative officers to expedite the payment of railroad fare refunds, it should be understood that the payment has to be made from a fund specially appropriated by the legislature for this purpose; consequently claims for funds are obliged to pass through the usual routine required by law for all claims against the State, and without any remissness on the part of administrative officers there may yet be an interval of several weeks between the filing of a claim and the final payment.

Courses of Instruction

Courses marked (*) do not carry college credits.

AGRONOMY

***a. Crops and Soils.** First and second terms. 12 cr.

How plants grow, fundamental features of plant growth, Soil as a factor in plant growth. Elementary soil studies; soil types, structure, soil water, soil temperature, moisture conservation, tillage methods, acid and alkali soils, cereal production; practical studies of wheat, barley, oats, corn and other cereals. Their production on dry and irrigated farms. Grain Judging and the Market classes of grain. Lect. 6; lab. 6.

7. Principles of Breeding. First term. 6 cr.

Variation, biometry, heredity, selection mutations, hybridization, reversion and prepotency as applied to plants and animals; methods used in improvement of plants. Lect. 12.

APPLIED ART

1. Freehand Drawing. First term. 2 cr. Fee \$.50.

Drawing from the cast in charcoal, pencil, or pen and ink. Lab. 4.

2. Painting. First term. 2 cr. Prerequisite Art 1. Fee \$.50.

Water colors, oils and tempera. Work from nature and still life. Lab. 4.

7. Design. First term. 2 cr. Fee \$.50.

Applied design and use of water colors. Students submit original designs. Lab. 2.

AGRICULTURAL EDUCATION

1. Vocational Agricultural Education. First term. 4 cr.

For students preparing to teach agriculture in the high schools. Organization of the class equipment, laboratory instruction, field

excursions, experimental plants, community work and agricultural clubs. Lect. 8.

***S1. Agriculture for Teachers.** First term. 3 cr.

A course in the fundamentals of agriculture and methods of teaching it. Phases of the subject which apply to Montana conditions will be emphasized. Class room discussions, lectures, laboratory exercises and the preparation of lesson plans. Lect. 6.

6. Agricultural Economics. First term. 3 cr.

Agricultural economic problems; value and rent of land; Agricultural labor; rural credit; cooperative associations. Lect. 6.

7. Rural Sociology. First term 3 cr. Prerequisite Sociology 4.

Rural social problems; rural health; country church; rural schools; roads; recreations etc. Lect. 6.

BOTANY

2. Systematic Botany. First term. 5 cr. Prerequisite Botany

1. Fee \$3.

Principles underlying classification and application of principles in laboratory and field; especially Montana plants. Lect. 4; Lab. 6.

COMMUNITY ENTERTAINMENT AND RECREATION

The rural teacher is the logical leader of the community in which she teaches, yet she is seldom trained to assume such leadership and often knows little of the problems of the country community. The following courses will be made intensely practical and based upon the actual needs of the summer session students.

***a. Community Recreation.** First term. 3 cr.

Plays and games, school equipment, story-telling, etc. Community singing, physical training, community activities. A study of individual community problems. Lectures and Demonstrations 6.

***b. Public Entertainment.** First term. 3 cr.

Plays and how to train for them and present them. Programs for all occasions. Lists of material containing lists of plays, dialogues, recitations for any and all occasions. Weekly programs produced by groups of Summer Session students in which they take representative communities and put on programs to suit that particular community. Lectures and Demonstrations 6.

CHEMISTRY

1. **General Chemistry.** First term. 6 cr. Fee \$5; deposit \$3.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds, and elementary qualitative analysis. Lect. 8; Lab. 4.

5. **Agricultural Organic Chemistry.** First term. 6 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4.

Compounds of the aliphatic and aromatic series and organic materials of interest to students of agriculture and home economics. Lect. 8; Lab. 4.

7. **Agricultural Chemistry.** First term. 6 cr. Prerequisite Chemistry 5. Fee \$6; deposit \$4.

Composition and reaction of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of feeding stuffs and of dairy products and problems of farm sanitation. Lect. 8; Lab. 4.

*a. **Elementary Chemistry.** Second term. 5 cr. Fee \$4; deposit \$4.

Lectures with experimental illustrations, and recitations on general elementary chemistry. Special emphasis will be given to the application of the science to daily life and to agriculture. Lect. 6; lab. 4.

CIVIL ENGINEERING

6. **Mechanics of Materials.** First term, 5 cr. Prerequisite Civil Engineering 5.

Elasticity and strength of timber, brick, stone, and metals. Theory of beams, columns, and shafts. Lect. 10.

8. **Strength of Materials.** First term. 1 cr. Prerequisite Civil Engineering 6. Fee \$2; deposit \$2.

Experimental determinations of the strength and the several moduli of the more important of the materials of engineering. Lab. 2.

ECONOMICS AND SOCIOLOGY

3. **Economics.** First term. 3 cr.

Principles of economic science. Study of such questions as labor and capital, banking, transportation, and taxation. Lect. 6.

4. **Sociology.** First term. 3 cr.

Introduction to sociology. Attention given to the problems of marriage and divorce, immigration, race questions, charities and corrections, pauperism and crime. Lect. 6.

EDUCATION

1. **Psychology.** First term. 3 cr.

General view of modern psychology, methods and materials of psychological investigation. Lect. 6.

2. **History of Vocational Education.** First term. 3 cr.

A brief survey of industrial education prior to 1800, some of the most significant developments during the nineteenth century, and the present status and need, including a brief study of vocational guidance. For home economics students. Lect. 6.

4. **Educational Psychology.** First term. 3 cr.

Continuation of course 1, but considered from the standpoint of the studies of the curriculum. This will include some genetic and experimental psychology. Lect. 6.

5 **Theory and Practice of Teaching.** First term. 3 cr.

A study of the aims of education, the fundamentals of teaching, the recitation, class management, and the use of scales. Lect. 6.

ENGLISH

*a. **English.** First term. 4 cr.

Practice in spelling, punctuation, note taking, letter writing, and the simpler forms of composition. Lect. 8.

*b. **English Composition.** Second term. 4 cr.

The paragraph and its development; the news item and short news story; business forms; practice in oral and written composition. Lect. 8.

HOME ECONOMICS

1a. **Foods.** First term. 3 cr. Fee \$2.50.

This course deals with the principles involved in the processes of cookery and a thorough study of the composition of the various foods used in the diet.

1b. **Foods.** First term. 3 cr. Fee \$2.

In this course, careful study is given to the various methods of food preservation and the more complex cookery processes.

11. **Clothing.** First term. 3 cr. Fee \$2.

Intensive work on hand and machine sewing, use and alterations of patterns, and subject matter for elementary and secondary schools is emphasized.

12. **Clothing.** First term. 3 cr. Fee \$4. Prerequisite Clothing 11.

In this course standard commercial patterns are adopted to elementary dress design and construction.

13. **Textiles.** First term. 4 cr. Fee \$1.

A study of textile fibers, structure and properties. This course develops judgment in selection of textile fibers for the house and clothing.

HOME ECONOMICS EDUCATION

2. **Special Methods in Home Economics.** First term. 4 cr.

Theory and practice of teaching domestic science and domestic art. Study is made of courses in various types of institutions. Courses of study are planned for graded schools, high schools and colleges. Lesson plans are given especial attention. Lect. 6; lab. 2.

HORTICULTURE

a. **Plant Propagation and Tree Planting.** First term. 4 cr. Fee \$1.

Plant propagation with special reference to the methods of multiplying fruit and planting of trees. The latter part of the course deals with simple principles of ornamental planting and ornamental plants, and the growing of trees adapted to Montana conditions. Lect. 8.

MECHANIC ARTS

*b. **Forge.** First term. 2 cr. Fee \$2; deposit \$2.

Care and manipulation of fire, iron, forging, including the operation of drawing, upsetting, pointing, bending, welding, calculation of stock; implement repairs, plow pointing, manufacture of chains, hooks, clevises, etc. Lab. 4.

*n. **Mechanical Drawing.** First term. 2 cr.

Machine and architectural detail drawing, tracing and blue printing; isometric and cabinet projection; intersections and development of surfaces with application in roof framing and sheet metal work. Lab. 4.

*e. **Pattern Making.** First term. 2 cr. Fee \$1.

Allowances on pattern for draft, shrinkage and finish, construction of patterns for pulleys, hangers, machine parts and pipe fittings, and the necessary core boxes. Lab. 4.

*s. **Farm Motors.** First term. 3 cr. Fee \$2.

The gas engine, with practice in operating and locating trouble. Tractor practice. Lect. 2; lab. 4.

MATHEMATICS

***f. Industrial Arithmetic.** First and second terms. 4 cr.

Fundamental processes of arithmetic relating to home and farm experience. Lect. 4.

***b. Advanced Algebra.** First term. 4 cr.

Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional zero), radicals, etc. Lect. 8.

3. Engineering Mathematics. First term. 5 cr.

Continuation of analytical geometry and work in calculus covering "Woods & Bailey" course in mathematics, Vol. 1, with the exception of the last three chapters. Lect. 10.

5. Engineering Mathematics. First term. 4 cr.

Continuation of course 4. Lect. 8.

8. Trigonometry and Logarithms. First term. 4 cr. Lect. 8.

9. College Algebra. First term.

Covers the ground given to algebra in Mathematics 1, 2. Lect.

10.

13. Statistics. First term. 3 cr. Prerequisite Mathematics 4. Lect. 6.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics.

15. Mathematical Theory of Investments. First term. 3 cr. Prerequisites Mathematics 2, 9 or 16. Lect. 6.

MUSIC

Summer school students will have opportunity to study voice or piano with members of the college faculty. Prof. A. H. Currier, Director of the Music Department, will give instruction in singing, and Miss June Hartman in piano. Prospective students are invited to address these instructors for further information before the session opens. The tuition is as follows:

Voice, 2 half hour lessons per week for the session.....	\$20.00
Piano, 2 half hour lessons per week for the session.....	\$15.00

Practice pianos at the College may be rented at the following rate:

Piano Practice, one hour daily for the session.....	\$2.00
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PHYSICS

***a. Elementary Physics.** Second term. 4 cr. Fee \$2.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound, heat, light, electricity and magnetism. Lect. 6; lab. 2.

1. Engineering Physics. First term. 3 cr.

More mathematical than Physics 1a, and particularly designed to meet the needs of students in engineering. Students who **have** not completed the calculus, mathematics 4, are required to take it during the same year that Physics 1 is taken. Lect. 6.

2. Physical Measurements. First term. 3 cr. Fee \$2.

Laboratory course designed to supplement Physics 1. Lect. 4.

5. Electricity and Magnetism. First term. 3 cr. Fee \$2.

Prerequisites Physics 1, 2, Mathematics 4.

Methods for the exact measurements of resistance, electromotive force, current, capacity, and the co-efficient of self-induction. Calibration of commercial instruments, insulation testing, and magnetic measurements. Lect. 4; lab. 2.

Also any one of the following graduate courses:

11. Electron Theory.

12. Defraction Phenomena.

13. Kinetic Theory of Gasses.

15. Quantum Theory.

POULTRY HUSBANDRY

41. Poultry Management. First term. 4 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and breeding, preparation for and marketing of poultry products. Lect. 6; lab. 2.

SECRETARIAL WORK.

Practice with various kinds of office appliances and equipment, such as adding machines, addressing machines, filing, etc. Lect. 2; lab. 4.

3. Typewriting. First term. 3 cr. Fee \$1.

Use and care of typewriters. Exercises for the development of proper wrist and finger movements, and for the mastery of the keyboard. Practice in letter writing and the use of carbon. Lab. 6.

6. Office Practice. First term. 3 cr.

9. Principles of Accounting. First term. 3 cr.

Principles underlying accounting in general. Laboratory exercises. Lect. 2; lab. 4.

TRADES AND INDUSTRY

***S1. Manual Training.** First year. First term. 2 cr.

The work this year will be devoted to practical drawing, lettering, and the selection and care of woodworking tools and a series of projects involving the use of the common tools used in bench work in wood. Lect. and lab. 4.

16. Organization and Administration of Trades and Industrial Education or Manual Arts. First term. 3 cr.

(1). Federal acts prior to the Smith-Hughes' act, which furthered Industrial or Manual Arts. (2). The Smith-Hughes' law with reference to Industrial Education. (3). Montana plans for Vocational Education. (4). Relation of Industrial Education to general education. (5). General problems of Industrial Education: (a) Classification of content of courses of study to fit conditions as to age, experience, school or educational qualifications, specific local needs. (b) Study of related matter content to best fit the special trade courses taught, or the trades concerned. (6) Specific schools or classes: (a) All day industrial school; (1) Unit trade. (2) General industrial school. (b) Part time schools; (1) Trade extension. (2) Trade preparatory. (3) General continuation. (c) Evening schools or classes. (d) Plans for establishing such schools or classes. Lectures 6.

17. Methods of Teaching in Industrial Schools. First term. 3 cr.

A course suitable for both shop and related subjects, teachers who have already had trade contact. An analysis of content following the method as given by Mr. Allen in his recent regional conferences on instructor-training. It includes both shop and related subject matter. Lect. 6.

A teacher training course for related subjects teachers in part time, evening, and all-day schools will be offered, if called for by five or more.

ZOOLOGY

2. Vertebrate Zoology. 5 cr.

A study of vertebrate animals with some consideration of the more important land-inhabiting invertebrates; classification, habits, biology, economic considerations. Lect. 6; lab. 4.

Roster

OF COMMANDANT, CADET OFFICERS AND CADET NON-COMMISSIONED OFFICERS.

COMMANDANT

Bubb, John P. Professor of Military Science and Tactics

ASSISTANT

Beers, Theodore L. Sargeant

COMPANY A

Officers

Jackson, Clarence Captain
Bachman, Lester Lieutenant
Bennett, William J. Lieutenant
Bolles, Henry J. Lieutenant

Non-Commissioned Officers.

Fenton, J. Stanley Sargeant
Bentall, Frank M. Sergeant
Dean, Richard Howell Sergeant
Millette, Francis S. Sergeant
St. Clair, Ward Sergeant
Wildman Herbert Sergeant
Kelly, Earl J. Sergeant
Conklin, Melvin Sergeant
Pouder, Oliver Sergeant
Garvin, William J. Corporal
Mathews, Emmett Corporal
Holderby, Jess M. Corporal
Mathews, Hollis Corporal
Poulsen, E. B. Corporal
Albrecht, Arne C. Corporal
Cruzen, Fred T. Corporal
Cogswell, Edward B. Corporal

Degenhart, Frank H.	Corporal
Hollister, Bruce	Corporal
Luther, Merrill K.	Corporal
Chestnut, Ben B.	Corporal
Holliday, Minor T.	Corporal

COMPANY B

Officers

Brown, James A.	Captain
Newton, Wesley H.	Lieutenant

Non-Commissioned Officers.

Burgoyne, William S.	Sergeant
Williams, Orvill	Sergeant
Neill, Frank	Sergeant
Moriarty, James M.	Corporal
Bonn, Fred L.	Corporal
Sabin, George C.	Corporal
Lee, Hjalmer	Corporal
Farrell, Richard H.	Corporal

Register of Students

1919-1920

GRADUATE STUDENTS

Graduate Students Candidates for Degrees

Ladenberg, Carl E.	Electrical Engineering	Columbia Falls
Lescher, Taylor	Electrical Engineering.....	Great Falls
Peck, Henry S.	Electrical Engineering	Butte
Wylie, Lawrence	Electrical Engineering.....	Bozeman

Graduate Students Not Candidates for Degrees.

Abbey, Myron J.	Agronomy	Bozeman
Holmes, Nina	Applied Art	Bozeman
Holst, John H.	Animal Husbandry.....	Bozeman
Johnson, L. Ross	Agricultural Education.....	Bozeman
Nutting, Grace Bingham	Botany and Bacteriology.....	Lititz, Pa.
Quaw, Marjorie	Applied Art.....	Bozeman
Stanley, Ernest Brook.....	Animal Husbandry.....	Whitehall
Streets Rupert B.	Botany and Bacteriology.....	Helena

COLLEGE STUDENTS

SENIORS

Arneson, Elmer Martin	Agronomy.....	Big Timber
Baker, Ada	Secretarial	Columbia Falls
Berg, Sigvald	Architectural Engineering.....	Helena
Bush, Elmer Joseph	Civil Engineering.....	Pony
Borton, Albert Jesse	Agronomy	Glasgow
Chattin, Earl William	Agronomy	Big Timber
Christenson, Anker Lawrence.....	Mechanical Engineering	Lancaster W.
Corkins, Clifford	Entomology and Zoology.....	Joliet
Dickman, Herman Louis	Agricultural Education.....	Truly
Dickson, James Harold	Animal Husbandry.....	Bozeman
Flynn, Charles Jess.....	Electrical Engineering.....	Logan
Glass, Ernest Roland	Electrical Engineering.....	Waverly, Kan.
Green, Ruth	Botany and Bacteriology.....	Belgrade
Hagan, Paul Joseph	Animal Husbandry.....	Glendive

Hall, Genevieve	Home Economics.....	Bozeman
Harris, Vera B.	Home Economics.....	Bozeman
Hastings, John L.	Electrical Engineering.....	Joliet
Henry, Forrest Gleason	Electrical Engineering.....	Townsend
Herriott, Evelena Ara	Home Economics.....	Thompson Falls
Holden, Zaydah A.	Home Economics.....	Lebanon, Wash.
Hollier, Trena	Home Economics.....	Bozeman
Hoem, Arthur	Mechanical Engineering.....	Butte
Jacoby, George	Architectural Engineering.....	Helena
Jones, Neil R.	Agricultural Education.....	Mazeppa, Min.
King, Kenneth M.	Entomology and Zoology....	Whitehall
Kohnen, John Homes	Civil Engineering.....	Great Falls
Kyle, Frances	Home Economics.....	Bozeman
Larse, Victor Fridtjof	Agronomy	Plains
Lease, Helen Elizabeth	Home Economics.....	Great Falls
Linfield, Leila Mary	Applied Art.....	Bozeman
Mabee, William B.	Entomology and Zoology....	Glasgow
Marquis, Minnie Ellen	Home Economics.....	Bozeman
Mashin, Ladimir	Animal Husbandry.....	Chicago, Ill.
Michel, John Henry	Electrical Engineering.....	Bozeman
McConnell, Grant B.	Civil Engineering.....	Helena
McLaughlin, Eugene Milton.....	Chemistry	Billings
Oberle, Henry	Electrical Engineering.....	Bozeman
Pickens, Russel Marion	Chemistry	Huntley
Pitts, Raymond Benton	Entomology and Zoology....	Bozeman
Rice, Hubert M.	Animal Husbandry....	Los Angeles, Cal.
Roberts, Otto Paul	Animal Husbandry.....	Bozeman
Roney, Clyde Ellis	Electrical Engineering.....	Missoula
Rose, Helen	Botany and Bacteriology....	Bozeman
Rowe, Forrest	Animal Husbandry....	Pasadena, Cal.
Seeley, Evelyn Georgiana.....	Secretarial	Bozeman
Smith, Stephen Edward	Agricultural Education	Bozeman
Snyder, Bess Irene	Home Economics.....	Clarion, Pa.
Stark, Albert P., Jr.....	Industrial Chemistry.....	Livingston
Stone, A. Parker	Animal Husbandry.....	Bozeman
Stone, Mary Louise	Home Economics.....	Bozeman
Sullivan, Ella Delphine	Home Economics.....	Townsend
Sutherland, Edward L.	Civil Engineering.....	Bozeman
Sweat, Jack	Agronomy	Dutton
Switzer, Florence	Entomology and Zoology....	Jeffers
Taylor, Homer C.	Animal Husbandry.....	Bryant, Wash.
Tobey, Willard H.	Animal Husbandry.....	Highwood
Tyler, John Luck	Industrial Chemistry.....	Nashville, Tenn.
Walker, John Paul	Agricultural Education.....	Bozeman
Woolridge, Earl	Agricultural Education.....	Chinook

JUNIORS

Baker, Alfred	Animal Husbandry.....	Whitehall
Beach, Ben	Agricultural Education	Mitchell
Beauchamp, Pearl	Home Economics.....	Bozeman
Benepe, Lucien	Agronomy	Bozeman
Bowen, John	Agronomy	Worden
Bowen, Lowell E.	Architectural Engineering.....	Butte
Bradford, Loren O.	Architectural Engineering	Livingston
Briggs, Ian	Agronomy	Darby
Burgess, Aline	Secretarial	Bozeman
Burgess, Marjorie	Home Economics.....	Bozeman
Carroll, Charles P.	Civil Engineering.....	Dillon
Carey, Helen M.	Secretarial	Polson
Dawes, Robert Earl	Electrical Engineering.....	Bozeman
Drummond, Lillian Helen	Secretarial	Yakima, Wash.
Durkee, Lindley Rathburn	Architectural Engineering.....	Polson
Eaton, Harold	Animal Husbandry.....	Fredonia, N. Y.
Ellingson, Henry Joseph.....	Electrical Engineering.....	Big Timber
Farnum, Ernest Charles	Agriculture	Harlem
Finch, Fred	Animal Husbandry.....	Dillon
Flanagan, Mary Catherine	Home Economics	Anaconda
Forbes, Frances E.	Home Economics.....	Helena
Gibbs, Benjamin	Electrical Engineering.....	Harlowton
Gilman, Vergle Day	Horticulture	Bozeman
Hall, Bernice	Secretarial	Bozeman
Hannah, Georgia Belle	Secretarial.....	Fort Benton
Hart, Glenn	Electrical Engineering.....	Harlowton
Hauseman, Dean M.	Secretarial.....	Virginia City
Hibbert, Norman	Animal Husbandry.....	Chicago, Ill.
Hill, Helen Maxine	Home Economics.....	Great Falls
Hilles, George	Animal Husbandry.....	Evanston, Ill.
Hodgskiss, Grant Henry	Electrical Engineering.....	Choteau
Hoffman, Carl R.	Chemical Engineering.....	Helena
Holderby, Josephine	Industrial Chemistry.....	Bozeman
Hollier, Myrtle	Home Economics.....	Bozeman
Hollingsworth, Harley W.	Architectural Engr.....	Thornberg, Ia.
Johnson, Edith	Botany and Bacteriology....	Lewistown
Kuhns, Ray	Chemical Engineering.....	Kalispell
Limbert, Harvey Emmett.....	Animal Husbandry.....	Emigrant
Major, Glenn Burnham	Civil Engineering.....	Helena
MacMillan, Gregor M.	Secretarial	Butte
McConnell, Robert E.	Horticulture	Lewistown
McFarlin, Alfred E	Mechanical Engineering.....	Butte
McFarlin, George Clark	Animal Husbandry.....	Butte
McRoberts, Lewis Henry	Industrial Chemistry.....	Bozeman

Mecklenberg, Walter Lewis.....	Animal Husbandry.....	Chance
Moebus, Henrietta Catherine....	Home Economics.....	Butte
Neville, William B.	Electrical Engineering.....	Helena
Niemi, Leonard	Mechanical Engineering.....	Red Lodge
Noble, Ruth Elizabeth	Home Economics.....	Whitehall
Pierce, Stephen Clark Jr.....	Chemical Engineering.....	Livingston
Pinckney, Alvin Joseph	Industrial Chemistry.....	Beemer, Nebr.
Pool, Gussie	Botany and Bacteriology....	Lewistown
Pool, Vernie	Home Economics.....	Lewistown
Potter, Earl Francis	Industrial Chemistry.....	Bozeman
Robinson, Ernest C.	Animal Husbandry.....	Lewistown
Rowe, Forrest F.	Animal Husbandry.....	Pasadena, Cal.
Saldine, Emil J.	Civil Engineering.....	Great Falls
Sayers, Leon David	Chemistry	Bozeman
Schneider, August Mills	Mechanical Engineering.....	Helena
Schurch, Edward C.	Electrical Engineering.....	Deer Lodge
Smith, Lois	Home Economics.....	Bozeman
Stanley, Edith Mary	Secretarial	Whitehall
Steel, Frederick Kippen	Electrical Engineering.....	Great Falls
Sutherland, Sidney Sampson.....	Agronomy	Polson
Thein, Edmund	Electrical Engineering.....	Ryegate
Thompson, Stewart McKinley....	Electrical Engineering.....	Great Falls
Tripp, Helen Louise	Home Economics.....	Butte
Wakefield, Arthur Russell.....	Agricultural Education.....	Forsyth
Ware, Frank	Industrial Chemistry.....	Calabar
Waterman, Eveyne Pauline	Secretarial	Bozeman
Wesch, Florence Christine	Home Economics.....	Billings
Whitacre, Gladys	Home Economics.....	Choteau
Wiles, Glenn Dewey	Chemistry	Columbia Falls
Wise, Howard Willis	Mechanical Engineering.....	Hardin
Wylie, John, Jr.	Civil Engineering	Bozeman

SOPHOMORES

Aitken, Forence Rose	Entomology and Zoology.....	Bozeman
Alquist, Merrill Kenneth	Mechanical Engineering.....	Conrad
Amer, Ray	Mechanical Engineering.....	Anaconda
Bachman, Lester	Mechanical Engineering.....	Grantsdale
Becker, Norma Lena	Secretarial	Bozeman
Bennett, William Jonathan	Industrial Chemistry.....	Anaconda
Bentall, Frank Maurice	Mechanical Engineering.....	Hathaway
Black, Jesse C	Civil Engineering.....	Whitehall
Bogy, Tom Vital	Electrical Engineering.....	Chinook
Bohart, Marjorie Ellen	Entomology and Zoology.....	Wilsall
Bole, Elizabeth	Chemistry	Bozeman
Bolles, Henry Jason	Civil Engineering.....	Gilbert, Ia.

Bonn, Fred Louis	Mechanical Engineering.....	Bozeman
Border, Evelyn	Home Economics.....	Bozeman
Bright, Kenneth Alfred	Electrical Engineering.....	Terry
Briner, Ethel	Secretarial	Big Timber
Buzard, Marion F.	Home Economics.....	Bozeman
Buzzel, Katherine	Applied Art	Conrad
Callow, Mertan E.	Electrical Engineering.....	Butte
Cameron, Ray Edison	Agronomy	Terry
Chauner, Lillian Belle	Secretarial	Bozeman
Chestnut, Ben Howard	Mechanical Engineering.....	Anaconda
Clark, Ella Louise	Home Economics	Bozeman
Cleland, Vera Ernestine	Home Economics.....	Hardin
Cline, Beatrice Marie	Secretarial	Bozeman
Clinkenbeard, Opal	Home Economics.....	Great Falls
Coffey, Lady Eulalia	Home Economics.....	Bozeman
Coffey, Royal	Botany and Bacteriology...	Bozeman
Conklin, Melvin	Industrial Chemistry.....	Oswego
Cooley, Elizabeth Content	Home Economics.....	Bozeman
Cooley, Charlotte Packard.....	Applied Art	Bozeman
Cottingham, Edward Basil	Chemistry	Helena
Courtney, Robert Dewey	Electrical Engineering	Harrison
Cox, Chloe	Home Economics.....	Ballantine
Cruzen, Fred Tyseling	Electrical Engineering	Havre
Davidson, Hazel	Home Economics	Townsend
Dean, Richard Howell	Industrial Chemistry.....	Manhattan
Degenhart, Frank Hugo	Electrical Engineering.....	Philipsburg
DeVore, Lloyd Grant	Agriculture	Been
Ebersole, Mary Ida	Home Economics	Glasgow
Egan, Mayme Ursula	Applied Art.....	Butte
Erdman, Wilson	Electrical Engineering.....	Libby
Farrell, Richard H.	Animal Husbandry.....	Seines
Fenton, Stanley John	Agriculture	Hardin
Forrest, Mildred Lois	Home Economics.....	Choteau
Fransham, Edna	Secretarial	Bozeman
Gagle, Roy Hulse	Mechanical Engineering.....	Hobson
Galliher, Vera Alice	Secretarial	Crow Agency
Garven, Fenimore William.....	Electrical Engineering.....	Fishtail
Gaston, Jorene	Secretarial	Havre
Gittinger, William	Mechanical Engineering....	Manhattan
Hagan, Edward	Civil Engineering.....	Havre
Haller, Helen	Home Economics.....	Stevensville
Harrer, Ruth Warren	Home Economics.....	Belgrade
Harrington, Cornelius Emmet...	Electrical Engineering.....	Butte
Harris, Charles Frank	Civil Engineering.....	Billings
Hoderby, Jesse Mathews	Industrial Chemistry.....	Bozeman

Holliday, Minor Tyndall	Civil Engineering.....	Havre
Holland, Dorothy Ann	Secretarial	Havre
Holmesland, Helen Marie	Applied Art.....	Sun River
Husemeyer, Carl T.	Electrical Engineering	Warm Springs
Huesmeyer, William	Electrical Engineering	Warm Springs
Johnson, Edgar	Animal Husbandry	Clancy
Jones, Ada Ruth	Secretarial	Bozeman
Jones, Wilma	Home Economics	Bynum
Jorgenson, Arthur R.	Electrical Engineering.....	Helena
Judd, Marlyn Elizabeth	Secretarial	Butte
Kelley, Earl James	Electrical Engineering.....	Bozeman
Kenck, Ralph Edward	Agriculture	East Helena
Kennedy, Walter A.	Electrical Engineering.....	Missoula
Keown, Kathryn	Chemistry	Bozeman
Kirk, Albert Bascom	Agronomy	Devon
Kruger, Arnold Reinhardt.....	Agriculture	Plains
Lewis, Helen	Home Economics.....	Howard
Lippert, William C	Agronomy	Townsend
Lindsley, Marguerite	Chemistry	Yellowstone Park
Lowman, Buford Jasper	Electrical Engineering.....	Como
Luther, Merrill Kenneth	Chemistry	Choteau
MacDonald, Donald Leon	Chemical Engineering.....	Butte
McDonnell, Aline	Secretarial	Bozeman
McKee, Anna Margaret	Secretarial	Jeffers
Mathew, Emmet Sheridan	Industrial Chemistry.....	Bozeman
Mathew, Hollis	Animal Husbandry.....	Bozeman
Mathews, Gladys Mary	Applied Art	Havre
Miller, Hutoka Mae	Home Economics.....	Bozeman
Mink, Leon Delmont	Industrial Chemistry.....	Huntley
Moriarity, James Milton	Electrical Engineering.....	Great Falls
Morphy, Lloyd Allen	Electrical Engineering	Leadore, Idaho
Morrison, Arthur Lawrence	Industrial Chemistry.....	Bridger
Munson, Arthur Milton	Electrical Engineering.....	Clancy
Muntzer, Theodosia Victoria	Home Economics	Butte
Murphy, Judith Olene	Chemistry	Alder
Nelson, Zelma	Home Economics	Dillon
Nichols, Marjorie Estelle	Chemistry	Bozeman
Noble, Dorothy Altha	Home Economics	Great Falls
Noble, Noneeta Leona	Secretarial	Great Falls
Olson, Elmer Richard	Civil Engineering	Alberton
Omta, Anna Margaret	Home Economics	Bozeman
Peterson, Millard	Chemistry	Culbertson
Pietsch, Lloyd Charles	Agriculture	Bozeman
Pollard, Rolla	Chemical Engineering	Craig
Pouder, Oliver	Electrical Engineering	Billings

Preston, Edward C.	Electrical Engineering	Stevensville
Reed, Dorothy Marion	Home Economics	Windham
Richards, Albert Baker	Electrical Engineering	Gibson
Ritschel, Eva	Home Economics	Wisdom
Robertson, Eugene	Chemistry	Bozeman
Rohrer, Mildred Alberta	Secretarial	Bozeman
Russell, Marian Jeanette	Secretarial	Hardin
Russell, Thomas F.	Agriculture	Bozeman
Ryan, Ambrose	Electrical Engineering.....	Great Falls
Sabin, George Theodore	Electrical Engineering.....	Hedgesville
Sackett, Nona Elzina	Home Economics.....	Billings
Shoebottom, Thomas Bruce	Civil Engineering.....	Huntley
Smith, Aravella.....	Secretarial	Bozeman
Sperling, Genevieve Blanche	Home Economics.....	Townsend
St. Clair, Ward Kent	Electrical Engineering.....	Glasgow
Stranahan, Mary Jeanette	Applied Art.....	Havre
Street, Joseph Dewey	Secretarial	Bozeman
Trackwell, Rosemary	Home Economics.....	Bozeman
Tretsvon, Oscar	Agriculture	Bozeman
Walker, Ruby Alma	Home Economics.....	Bridger
Ward, Rupert	Architectural Engineering.....	Choteau
Watts, Willard	Mechanical Engineering.....	Anaconda
Wildman, Herbert	Secretarial	Knowlton
Williams, Jessie Iona	Home Economics.....	Como
Willis, Phillip A.	Mechanical Engineering.....	Roundup
Winwood, Ralph Farrall	Animal Husbandry.....	Butte
Wocasek, Frances Josephine	Applied Art.....	Great Falls
Wylie, Paul	Agriculture	Bozeman
Young, Ethel Ellen	Home Economics.....	Bozeman

FRESHMEN

Alex, Howard	Agriculture	Bozeman
Albrecht, Arno C.	Civil Engineering.....	Great Falls
Alderson, William	Chemical Engineering.....	Bozeman
Anderson, Ruth	Home Economics.....	Belfry
Anderson, Clarence C.	Electrical Engineering.....	Toston
Anderson, Vernon	Electrical Engr.....	Minneapolis, Minn.
Anderson, Donald	Secretarial.....	Lake Hamilton, Fla.
Arkwright, Stanley	Secretarial.....	Miles City
Asbury, Fuhrman	Agriculture.....	Crow Agency
Asbury, Ralph	Electrical Engineering....	Crow Agency
Atterbury, James B.	Agriculture.....	Lyman, Wash.
Becker, Eaton	Agriculture.....	Washington, D. C.
Becker, Meda	Home Economics.....	Bozeman
Beck, Albert W.	Architectural Engineering.....	Basin

Belshaw, George E.	Chemistry	Bozeman
Bergstrom, Arthur	Electrical Engr.....	Minneapolis, Minn.
Berry, Robert A.	Electrical Engineering.....	Basin
Borton, Hugh	Civil Engineering.....	Glasgow
Brandenburg, Marie	Home Economics.....	Bozeman
Brook, John C.	Mechanical Engineering.....	Judith Gap
Brown, Alva	Electrical Engineering.....	Moccasin
Bryan, Clarence	Agriculture	Billings
Bryan, Warren E.	Civil Engineering.....	Billings
Buckingham, Earl M.	Electrical Engineering.....	Hardin
Buckingham, William H.	Agriculture	Lavina
Bulen, Aubrey	Mechanical Engineering.....	Shelby
Burgess, Dorothy	Botany and Bacteriology.....	Bozeman
Burley, Arthur Edward	Civil Engineering.....	Park City
Burlingame, Amy Louise	Applied Art.....	Great Falls
Burns, Mary Janet	Bctany and Bacteriology.....	Bozeman
Buzard, Walter L.	Secretarial	Bozeman
Campbell, Grace Oriel	Home Economics.....	Dupuyer
Campbell, John Paul	Chemistry	Bozeman
Campbell, Robert	Secretarial	Bozeman
Cashmore, Herbert Dewey	Electrical Engineering.....	Dillon
Cates, Edward	Electrical Engineering.....	Victor
Catron, Roy Irving	Agriculture	Bozeman
Chesterman, Don	Agriculture	Worden
Clack, Opal	Secretarial.....	Hobson, Mo.
Cline, Marie	Secretarial	Bozeman
Clopton, Myrtis C.	Applied Art.....	Bozeman
Cogswell, Edward	Electrical Engineering.....	Helena
Connelly, Orlando T.	Secretarial	Dillon
Corbly, Vivian D.	Secretarial	Bozeman
Corrigeaux, Gertrude	Secretarial	Cut Bank
Cotton, Howard M.	Agriculture	Glasgow
Cotton, Robert S.	Agriculture	Glasgow
Cox, Chloe	Home Economics.....	Ballantine
Crosby, John W.	Secretarial	Livingston
Crowley, Charles John	Mechanical Engineering.....	Lewistown
Crowley, John James, Jr.....	Electrical Engineering.....	St. Peters
Curl, Mary	Applied Art.....	Gardiner
Dahlstrom, Laura Christine.....	Home Economics.....	Bridger
Daley, Florence Elvine	Home Economics.....	Dupuyer
Daniels, Marguerite	Secretarial	Bozeman
Davis, Claudius	Mechanical Engineering.....	Dillon
Dean, Dorothy	Home Economics.....	Bozeman
DeKay, Garrett Leroy	Agriculture	Hysham
Dolan, William J.	Electrical Engineering.....	Libby

Donohoe, Carroll Paul	Civil Engineering	Whitehall
Donohue, Donald	Civil Engineering	East Helena
Draney, Margaret Ellen	Chemistry	Billings
Dunavan, David	Agriculture	Crichton, Saskatchewan
Dyer, Lloyd W.	Electrical Engineering	Moore
Elmer, Roma	Chemistry	Bozeman
English, Mary	Home Economics	Dupuyer
Erwin, George	Agriculture	Bozeman
Ewalt, Anita	Home Economics	Ekalaka
Felt, Herbert J.	Electrical Engineering	Anaconda
Ferrel, Lewis J.	Chemistry	Bozeman
Finley, George V.	Agriculture	Mt. Vernon, Wash.
Flook, Bernice	Secretarial	Lewistown
Flook, Walter D.	Civil Engineering	Lewistown
Ford, Ethan	Agriculture	Bozeman
Forswall, Oscar E.	Electrical Engineering	Belgrade
Fortin, Henry O.	Mechanical Engineering	Fortine
Gage, Perry	Architectural Engineering	Bozeman
Gallagher, John P.	Civil Engineering	Hysham
George, Marie	Home Economics	Billings
Getchell, Wayne	Electrical Engineering	Bozeman
Gilbert, Leslie	Mechanical Engineering	Perma
Gile, Clifford Gordon	Civil Eng.	White Sulphur Springs
Gleason, Thomas W.	Secretarial	Helena
Goodwin, Thomas K.	Entomology and Zoology	Helena
Graham, Lloyd	Agriculture	Kalispell
Green, John Henry	Agriculture	Fort Benton
Griffith, Clement	Chemistry	Bozeman
Hagen, Dorothy Annabelle	Secretarial	Great Falls
Halstead, Charles Beebe	Mechanical Engineering	Ashland
Hampton, Georgia	Home Economics	Jordan
Hardy, Wellington	Electrical Engineering	Forsyth
Harrington, Francis	Electrical Engineering	Butte
Heagney, Charles E.	Agriculture	Bozeman
Herren, Ruth M.	Home Economics	Havre
Hines, Judd W.	Mechanical Eng.	Chapman, Kansas
Hollister, Bruce	Civil Engineering	DeKalb, Ill.
Hubber, George	Agriculture	Belt
Huls, Alfred Spencer	Agriculture	Corvallis
Hunt, Herma	Secretarial	Bozeman
Hutchinson, Roy Emery	Agriculture	Forsyth
Hutton, Dorothy Alice	Secretarial	Bozeman
Hylton, Ralph Martin	Electrical Engineering	Denton
Irvine, William L.	Mechanical Engineering	Philipsburg
Jackson, Clarence	Civil Engineering	Jeffers

Jacques, Henry	Electrical Engineering.....	Butte
Johnson, Jacob Adam	Electrical Engineering.....	Worden
Johnson, Florence	Secretarial	Lewistown
Johnson, Dwight	Agriculture	Clancy
Johnson, Arthur E.	Secretarial	Fromberg
Johns, Ernest W.	Chemistry	Wilsall
Jordan, Howard	Mechanical Engineering.....	Bridger
Jump, Marguerite	Applied Art	Bozeman
Kading, Lee Floyd	Chemical Engineering.....	Deer Lodge
Keeler, Marion	Secretarial	Crow Agency
Kellams, Louise	Secretarial	Bozeman
Knight, Frank	Agriculture	Bozeman
Kohler, Clarice	Home Economics.....	Helena
Korslund, Harold	Electrical Engineering.....	Bozeman
Krauss, John Russell	Secretarial	Bozeman
Kuhns, Raymond	Chemical Engineering.....	Kalispell
Leary, Wilfred John	Electrical Engineering.....	Butte
Leckliter, Manila B.	Applied Art	Bozeman
Levengood, Archie	Architectural Engineering.....	Butte
Longeway, Marjorie	Home Economics.....	Great Falls
Lyndon, Charles Augustus	Agriculture.....	Lyndon, Alberta
Lyndon, William Lawrence.....	Electrical Eng.....	Lyndon, Alberta
MacMillan, Ella Jean	Secretarial.....	Miles City
McCarren, Raymond	Electrical Engineering.....	Anaconda
McCann, Harry	Mechanical Engineering.....	Helena
McCay, Harold F.	Secretarial	Bozeman
McCray, Adele Wilson	Botany and Bacteriology.....	Bozeman
McDonald, Donald Eugene	Agriculture	Bozeman
McLaughlin, William Lewis.....	Electrical Engineering.....	Missoula
Machemer, Levi	Agriculture	Bozeman
Mahan, John William	Secretarial	Harper, Kan.
Mahoney, Daniel A.	Secretarial.....	Bernard, Ia.
Manis, Beulah Mae	Secretarial.....	Big Timber
Mann, Havard William	Civil Engineering.....	Bozeman
Marston, Eleanor	Applied Art.....	Great Falls
Mashin, John	Agriculture	Chicago, Ill.
Mathews, Howard Wesley	Electrical Eng.....	Thompson Falls
Mathews, Roland Arthur.....	Electrical Eng.....	Thompson Falls
Meece, Millard	Secretarial	Manhattan
Mead, Gerald Wayne	Agriculture	Huntley
Mitchell, Fergus G.	Agriculture.....	Great Falls
Moebus, Marie Margaret	Home Economics.....	Butte
Moody, Alice Katherine	Home Economics.....	Butte
Moore, Knox Duncan	Chemistry	Billings
Moore, Glenn	Electrical Engineering.....	Glendive

Moore, Cyril Clayson	Agriculture	Poplar
Morden, George M.	Agriculture	Anaconda
Moriarity, James Milton	Electrical Engineering.....	Great Falls
Mountjoy, Charles Raymond.....	Agriculture	Kalispell
Mowre, Carson	Electrical Engineering.....	Billings
Mumedy, Anna M.	Secretarial	Ekalaka
Myers, Merle	Secretarial	Bozeman
Nahlinger, Mary J.	Secretarial	Bozeman
Nelson, Marion Eunice	Home Economics.....	Lewistown
Neuman, Leonard Joseph	Electrical Engineering.....	Libby
Nordstrom, Harriet Lucile	Secretarial.....	Big Timber
Norton, Ruth Lenore	Secretarial.....	East Helena
Norvall, Ann	Applied Art.....	Conrad
Oberle, Nicholas	Chemical Engineering.....	Bozeman
Olson, Aaron	Agriculture.....	Judith Gap
Owings, Reuben F.	Electrical Engineering.....	Billings
Packer, Miriam Hale	Home Economics.....	Miles City
Pasha, John R.	Agriculture	Bozeman
Paugh, Loula Vetter	Secretarial	Jeffers
Peterson, Millard E.	Botany and Bacteriology....	Culbertson
Phillips, Bessie B.	Secretarial	Glasgow
Phillips, Herbert Franklin	Electrical Engineering.....	Billings
Pigg, Victor G.	Secretarial.....	Sedro Wooley, Wash.
Poorman, Mildred	Chemistry	Livingston
Popham, William Lee	Agriculture	Corvallis
Porter, Ella Brewer	Secretarial.....	Yakima, Wash.
Poulsen, Edward B.	Mechanical Engineering.....	Laurel
Quist, Clair Kingsley	Agriculture	Wisdom
Radcliff, Joseph Henry	Chemistry	Choteau
Rask, Harold E.	Agriculture	Kalispell
Rassley, George A.	Chemistry	Bozeman
Reynolds, Michael	Agriculture	Billings
Rice, Victor Yale	Agriculture.....	La Harp, Ill.
Richards, Albert E.	Electrical Engineering.....	Gibson
Rider, Maude	Secretarial	Bozeman
Ritchey, Lee Harvey	Chemical Engineering.....	Livingston
Rivenes, Alf	Electrical Engineering.....	Glendive
Roth, Lillian	Secretarial	Great Falls
Rouse, James Byron	Civil Engineering.....	Libby
Rouse, Robley D.	Mechanical Engineering.....	Libby
Rundell, Harry Whitfield.....	Mechanical Engineering.....	Whitehall
Rutledge, Lenore	Secretarial	Bozeman
Rutter, Lewis Henry	Electrical Engineering.....	Hinsdale
Schmid, Flora	Secretarial.....	White Sulphur Springs
Schreiner, Olive Mae	Chemistry	Townsend

Sears, Thomas Arthur.....	Mechanical Engineering.....	Bozeman
Shepard, William H.	Architectural Engineering.....	Manhattan
Shindoll, Virgil Vincent	Electrical Engineering.....	Missoula
Sloan, Jeanette	Applied Art.....	Bozeman
Smith, John Clair	Civil Engineering.....	Fromberg
Smith, Robert Jesse	Electrical Engineering.....	Great Falls
Stacy, Clarence S.	Architectural Engineering.....	Bozeman
Stphens, Irving Thayer	Agriculture	Harlowton
Stephenson, John Webster	Agriculture	Chicago, Ill.
Stocker, Mae Carolyn	Secretarial	Grant
Story, Nelson	Electrical Engineering.....	Bozeman
Stronach, Edith Mary	Secretarial	Chester
Stubbs, Amelia Catharine	Home Economics.....	White Sulphur Spgs.
Stump, Fred	Electrical Engineering.....	Missoula
Sweeney, Joseph A.	Agriculture	Chicago
Swan, Leonard Russell	Mechanical Engineering.....	Livingston
Swanson, Frank A.	Electrical Engineering.....	Bozeman
Swanson, Ernest Theodore	Electrical Engineering.....	Great Falls
Swanson, Ruby Frances	Home Economics.....	Troy
Switzer, Ruth Marian	Secretarial	Jeffers
Tallman, Mildred Elizabeth.....	Secretarial	Bozeman
Taylor, Charles R.	Chemical Engineering.....	Forsyth
Teigen, Peter M.	Electrical Engineering.....	Teigen
Ten Haaf, Aleda May.....	Applied Art.....	Bozeman
Tenney, Howard L.	Mechanical Engineering.....	Bozeman
Thomas, Richard Rufus	Electrical Engineering.....	Anaconda
Thompson, Anita	Chemistry.....	Great Falls
Towne, Kathryn Mildred	Chemistry	Livingston
Van Fleet, George Sigler.....	Electrical Engineering.....	Bozeman
Waite, Janice Ramona	Secretarial.....	Big Sandy
Waldorf, Lucien Francis	Chemistry	Bozeman
Walker, Virginia Mary	Home Economics.....	Bozeman
Walker, John Edward	Electrical Engineering.....	Highwood
Walsh, Helen B.	Secretarial	Bozeman
Walker, James Robert	Agriculture	Huntley
Weichselbaum, LaMonte L.....	Electrical Engineering.....	Hamilton
Wells, Dana Ernest	Secretarial.....	Park City
Westlake, Myron M.	Agriculture	Bozeman
Whitney, Wallace Ferdinand.....	Mechanical Engineering.....	Livingston
White, Harold C.	Mechanical Engineering.....	Bozeman
Williams, Vere	Secretarial	Bozeman
Williams, Hallam Albert	Electrical Engineering.....	Anaconda
Wilson, Joseph Hill	Secretarial.....	Long Beach, Calif.
Wilson, Mildred Cecelia	Home Economics.....	Great Falls
Wise, Homer Angelo	Chemical Engineering.....	Hardin

Wise, Harold	Electrical Engineering.....	Great Falls
Wood, Rosalie	Applied Art.....	Stevensville
Wylie, Paul R.	Agriculture	Bozeman
Young, Elizabeth	Home Economics.....	Ryegate
Zacher, Vernon	Mechanical Eng.....	Jamestown, N. D.
Zuck, Merlin Dunmore	Electrical Engineering.....	Scobey

SCHOOL OF AGRICULTURE

THIRD YEAR

Berg, Henry	Shawmut
Edwards, Harry G.,	Monarch
Millette, Francis	Cincinnati, Ohio
Moore, Roy	Dutton
Newman, Ernest W.	Heron
Newton, Wesley Howard	Roundup
Paugh, John Charles	Jeffers
Rouse, Harold Grant	Three Forks
Williams, Earl Lorenzo	White Sulphur Springs

SECOND YEAR

Buttleman, John George	Willow Creek
Buttleman, William	Willow Creek
Cameron, Walter H.	Lincoln
Kortte, Ray	Larchwood
Lish, Bert M.....	St. Ignatius
Malcolm, Alexander	Pray
Martin, Dana	Two Dot
Swenson, Erlin Magnus	Helena

FIRST YEAR

Addy, Jack Robert	Polson
Andrews, Charles J.	New London, Minn.
Auerbach, Frederick, Jr.,	Sunburst
Barton, Lee V.,	St. Louis, Mo.
Beglinger, John F.,	Switzerland
Betker, Oscar S.,	Sidney
Boonstra, Cornelius	Scobey
Breiner, Leland E.,	Missoula
Burgoyne, William S.,	Stevensville
Burns, George	Caledonia, N. Y.
Cok, Henry	Bozeman

Cok, Peter	Bozeman
Costello, Lawrence	Malta
Cowger, Lloyd	Red Lodge
Crane, Chester A.	Ft. Benton
Curtis, John J.	Miles City
Dahlstrom, Francis	Spokane, Wash.
Dayton, Andrew	Stevensville
DeChant, H. J.,	Adrian, Mich.
Dent, Elmer E.,	Brusette
DeWald, Edward	Sunburst
Dickerson, Warren K.,	River Forest, Ill.
Dofelmier, William M.	Butte
Doyle, Michael	Washoe
Dues, Clarence E.,	Roberts
Elwood, Porter W.,	Fairfield
Flood, William G.,	Park City
Fostveed, Hans O.,	Butte Creek
Fowler, William H.	Stanford
Fowler, William Ray	Wilsall
Francis, Carl R.	Miles City
Francis, William Perry	Wilsall
Gallis, Ole	Norway
Godtland, Paul	Butte
Gruel, Fred A.,	Red Lodge
Harbo, Ronald A.	Froid
Hansen, Richard O.,	Big Sandy
Harlan, George	Grey Cliff
Harris, Edward	Ashley
Hawk, Clarence A.	Missoula
Hennerbury, William	Morel
Higlee, John	Sand Coulee
Hoag, Henry J.	Whitefish
Hogseth, Adolp	Enid
Hoines, Ingolf	Luther
Hough, Ray A.	Belgrade
Isaacs, Ivan V.	Miles City
Jacobson, Matt	Neihart
Jensen, Johannes	Dovetail
Jensen, Johannes C.,	Dagmar
Jones, Clarence D.,	Bozeman
Jorgenson, Otto	Dagmar
Karlson, Aaron G.	Logan, Sweden
Kelling, Lloyd J.,	Baker
Kennet, Holton Perry	Helena
Kramer, Carl M.	Terry
Larson, Hilmer S.	Great Falls

LeCornu, Paul W.	Poplar
Lee, Hjalmer	Culbertson
Lee, Oliver C.,	Culbertson
Lee, Phillip A.	Great Falls
Longeway, Forrest H.	Great Falls
Lumberg, Charles J.	Cascade
Luttrell, Roland	Plains
McCay, Stewart J.	Anaconda
McClean, Thomas R.	Billings
Maryott, Abram	Roberts
Mendell, Oren Everett	Winifred
Meredith, Claude	Bozeman
Miller, Joseph H.	Billings
Mitchell, Raymond	Norbert
Mitchell, Roy	Norbert
Molstad, Ole	Roy
Moore, James G.	Big Sandy
Moore, William A.,	Great Falls
Murphy, Albert L.,	Alberta, Canada
Neill, Frank D.,	Helena
Nicholas, Bernie	Zimmerman, Minn.
Olgiati, Edward	Switzerland
Olson, Ronald L.	Mankato, Minn.
Owens, Walter Charles	Bozeman
Patchett, Alfred	Lothair
Peterson, James William	Roy
Peterson, Solomon	Atlanta, Kansas
Peterson, William M.	Helmville
Proebstel, Charles E.	Stark
Rasmussen, Oscar	Nevada, Iowa
Redman, Benjamin	Minneapolis, Minn.
Redfield, Donald	Bozeman
Reik, Hilmar William	Scobey
Reynolds, Archie	Lakato, N. D.
Riley, George O.	Chinook
Robinson, George	Malta
Sanstrom, Otto Albert	Bristol, Conn.
Schuh, Urban N.	Lewistown
Seeman, Gerry	Columbus
Sheldon, Earl R.	Brussett
Smith, Wilbur E.	Bozeman
Splaneman, Paul A.	Oskosh, Wis.
Stevens, Howard L.,	Watford, N. D.
Stratton, Elmer G.	Grandview
Stubbs, William	Bozeman
Sutherland, Charles Melton	Hysham

Sutherland, Walter	Great Falls
Swanson, Olaf	Bozeman
Sweet, Albert	Butte
Tait, Thomas	Howard
Tanner, John R.,	Square Butte
Tarrant, Hubert Charles	Toston
Thomson, Alexander	Anaconda
Thompson, Theodore	Big Timber
Trandum, Clarence	Baker
Tofte, Ole	Kolin
Tucker, Frederick S.,	Butte
Vander Veen, Rinse	Shepherd
Vinje, Carl Oscar	Kalispell
Walker, Francis H.	Opheim
Wallace, Dosia	Bozeman
Walton, Ben Maiden	Bozeman
Wilcox, Seldon	Bozeman
Willis, Nat.	Red Lodge
Wood, Ernest C.,	Loma
Yarbrough, Ernest	Hamilton
Young, Alvis Burnette,	Ryegate
Ziemkowski, Isidore	Hilger

SCHOOL OF HOME ECONOMICS

THIRD YEAR

Berg, Elsie	Shawmut
Goldberg, Alice	Hall
Redfield, Alta	Bozeman

SECOND YEAR

Buttleman, Meta	Willow Creek
Lippert Ruby Elizabeth	Toston

FIRST YEAR

Farquson, Doris	Jens
Gloyne, Ruth Woodward	Harlem
Halker, Ruth S.	Toston
Hughes, Addie	Silesia
Mockel, Edna	Toston
Onstad, Sophia	Westby
Preller, Louise Augusta	Miles City
Reynolds, Mrs. Archie	Bozeman
Riley, Mrs. E. H.	Bozeman
Vollmer, Marie D.	East Helena
Wessel, Alice M.	Manhattan

SCHOOL OF MECHANIC ARTS

THIRD YEAR

Brown, James A.,	Box Elder
Christopherson, Henry	Hobson
Hockersmith, Maurice	Great Falls
Williams, Orville G.,	Bozeman

SECOND YEAR

Ayers, Arnold C.,	Cameron
Brost, John M.,	Nashua
Jellison, Robert	Billings
Mackel, Norris	McAllister
Nixon, Clifford Young	Salesville
Wilkins, Llew Edgar	Kalispell
Willson, Virgel A.	Virgelle
Winterrowd, Irven	Great Falls

FIRST YEAR

Anderson, Frederick E.,	Plains
Ashman, Michael	Lewistown
Cavill, Stanley J.,	Barber
Centers, Hayden V.,	Hamilton
Chapman, John W.,	Bozeman
Christensen, Nels W.,	Sidney
Cook, Francis G.,	Willow Creek
Cooper, Frank James	Helena
Cooper, Howell R.,	Willow Creek
Cope, Charles	Millegan
Cope, Theodore	Millegan
Courville, Ben	St. Ignatius
Cox, Clarence M.,	Belgrade
Croff, James William	Raynesford
Davis, Marion R.,	Dillon
Doig, Walter	Sixteen
Eggen, Charles	Absarokee
Eggen, Oscar	Absarokee
Elkins, Wayne	Brooks
Evers, Paul H.,	Billings
Fiscus, Adam	Winifred
Fouse, Samuel Probus	Chance
Gahan, Ray	Raynesford
Gahan, Ralph	Raynesford
Gannon, George	New York City

Gokey, Peter J.,	Browning
Haines, Francis D.,	Clancy
Hardie, Clarence	Wilsall
Hogarty, Clyde R.,	Knowlton
Hoiner, Hjalmer	Luther
House, Leslie E.,	Bozeman
Hughes, Delno	Silesia
Jones, Mark Patrick	Great Falls
Jones, Norman V.,	Great Falls
Jones, Theodore Clinton	Intake
Jorgenson, John William	Big Sandy
Lang, Herbert Leonard	Minneapolis, Minn.
Libratoro, Moreno	Great Falls
Lynch, Theodore Patrick	Helmville
McCormick, Thomas J.,	Helmville
McGill, Ora Johnston	Santa Fe, N. M.
Markey, Frank	Milwaukee, Wis.
Michalek, Joseph Edward	Lohman
Mullen, Thomas John	Glasgow
Naef, Louis	Anaconda
Norton, John D.	Drummond
Oxford, Roy I.,	Havre
Page, James Arnon,	Twin Bridges
Pasha, Herbert R.	Bozeman
Philo, Clifford A.,	Deer Creek, Minn.
Randall, Connie	Minot, N. D.
Rexroat, Dale E.,	Ryegate
Rice, Howard E.,	Highwood
Roberts, Joseph	Missoula
Rostad, Orville	Lennepe
Sales, John A.	Cathaway, N. D.
Severtson, Arthur R.,	Valier
Snyder, Wesley Howard	Glasston
Stebbins, Marion Alfred	Wason Flats
Sullivan, Francis Daniel	Stevensville
Taylor, James R.	Belgrade
Thuerk, Harry M.	Dodson
Todd, Ohmer Terrel	Bozeman
Wells, Ralph	Great Falls
Weppeler, George	Columbus
White, Aaron R.	Bozeman
White, Peter E.,	Missoula
Wilke, John Ralph	Fortine
Wilson, Sam J.	Belt
Wunn, J. W.	Cogswell, N. D.
Zempele, Claude	Outlook

MUSIC STUDENTS.

Abbott, Mabel L.....	Piano	Bozeman
Aitken, Florence Rose	Voice	Bozeman
Alex, Howard	Voice	Bozeman
Berthot, Berenice.....	Piano	Bozeman
Beaucamp, Pearl	Piano	Bozeman
Bohart, Marjorie	Piano	Wilsall
Brewer, Helen A.....	Piano	Bozeman
Brown, Lora.....	Piano	Bozeman
Burgess, Marjorie M.....	Piano	Bozeman
Budd, Elva.....	Piano	Bozeman
Buzard, Marian.....	Piano	Bozeman
Buzzell, Katherine.....	Piano	Conrad
Carey, Helen.....	Piano	Polson
Christensen, Rachel.....	Piano	Bozeman
Clarke, Bethel.....	Piano	Salesville
Clarke, Russell.....	Piano	Salesville
Cleland, Vera.....	Piano	Hardin
Clopton, Myrtis C.....	Piano	Bozeman
Conklin, Melvin.....	Piano	Nina
Cooley, Charlotte.....	Voice	Bozeman
Cooley, Elizabeth.....	Piano	Bozeman
Crozier, Helen.....	Piano	Bozeman
Corrigeux, Gertrude.....	Piano	Cut Bank
Daniels, Marguerite C.....	Piano	Bozeman
DeVore, Lloyd G.....	Voice	Been
Duncan, Patty.....	Piano	Virginia City
Eggan, Oscar.....	Piano	Absarokee
Ellingson, Henry J.....	Voice	Big Timber
Esgar, Rea.....	Piano	Bozeman
Fabrick, Mrs. Dick.....	Piano	Three Forks
Finch, Hallie.....	Piano	Bozeman
Forbes, Frances.....	Piano	Helena
Fransham, Edna.....	Voice, Piano	Bozeman
Fuller, Ruth P.....	Voice, Piano	Bozeman
Geer, Medra.....	Piano	Bozeman
Green, Ruth M.....	Piano	Manhattan
Hagan, Dorothy.....	Voice	Great Falls
Hall, Bernice.....	Piano	Bozeman
Haller, Helen.....	Piano	Stevensville
Halker, Ruth.....	Voice, Piano	Bozeman
Harris, Dorothy.....	Piano	Bozeman
Harris, Vera.....	Voice, Piano	Bozeman
Hays, Lola.....	Piano	Bozeman
Hatfield, W. D.....	Piano	Bozeman

Hatfield, Mrs. W. D.	Voice	Bozeman
Herriott, Evelena	Piano	Thompson Falls
Hill, Helen M.	Voice	Great Falls
Holderby, Josephine	Piano	Bozeman
Hollier, Myrtle	Piano	Bozeman
Hollier, Trena	Piano	Bozeman
Hollingsworth, Harley	Voice	Thornberg, Ia.
Holm, Mrs. E. O.	Piano	Bozeman
Huff, Sarah C.	Voice	Bozeman
Hughes, Addie	Piano	Silesia
Hutton, Dorothy	Piano	Jeffers
Jones, Marguerite	Voice	Bozeman
Jones, Neil R.	Piano	Mazeppa, Minn.
Jones, Valena	Piano	Bozeman
Jones, Wilma	Piano	Bynum
Jump, Mrs. Floyd	Voice, Piano	Bozeman
Kammerer, Sophie	Piano	Bozeman
King, Kenneth	Voice	Bozeman
Lawrence, Lolita	Piano	Bozeman
Lease, Helen E.	Piano	Great Falls
Leckliter, Manila B.	Voice	Salesville
Lewis, Helen	Piano	Howard
Linfield, Lelia	Piano	Bozeman
Lippert, Ruby	Voice	Toston
Marquis, Minnie Ellen	Voice, Piano	Bozeman
Maryott, Abram	Voice	Red Lodge
Moebus, Henrietta	Piano	Butte
Montgomery, Ruth	Piano	Bozeman
Mocre, Jewel	Piano	Bozeman
Morris, Mrs. E. A.	Piano	Bozeman
McBroom, Marian	Piano	Bozeman
McBroom, Robert	Piano	Bozeman
McConnell, Robert	Voice	Lewistown
Oberle, Henry	Voice	Bozeman
Omstad, Sophie J.	Piano	Westby
Opdyke, Clandena	Piano	Bozeman
Packer, Miriam	Piano	Miles City
Peterson, Millard	Piano	Culbertson
Porter, Ella Brewer	Piano	Yakima, Wash.
Robinson, Ernest	Voice	Lewistown
Robinson, Genevieve	Piano	Bozeman
Rose, Helen	Piano	Bozeman
Roth, Lillian	Piano	Great Falls
Rutledge, Lenore	Piano	Bozeman
Sackett, Nona	Piano	Billings
Seeley, Evelyn	Voice	Bozeman

Seeley, Mabel.....	Voice	Bozeman
Severtson, Arthur R.....	Piano	Valier
Siegel, Ruth.....	Piano	Bozeman
Snyder, Bess Irene.....	Piano	Clarion, Pa.
Stocker, Mae.....	Piano	Grant
Stone, Mary Louise.....	Piano	Bozeman
Stone, A. Parker.....	Piano	Bozeman
Sweeney, Joseph.....	Voice	Chicago, Ill.
Switzer, Florence.....	Voice	Jeffers
Todd, Lloyd.....	Piano	Bozeman
Todd, Verle.....	Piano	Bozeman
Towne, Kathryn.....	Piano	Livingston
Trigg, Mrs. Paul.....	Piano	Bozeman
Tripp, Helen Louise.....	Piano	Butte
Watson, Adena.....	Piano	Bozeman
Watson, Sarah A.....	Piano	Bozeman
West, Isabel A.....	Piano	Bozeman
Wetzel, Lola.....	Piano	Bozeman
Whitacre, Gladys.....	Piano	Chouteau
Wiles, Glen.....	Voice	Columbia Falls
Williams, Marie.....	Piano	Bozeman
Wvatt, Mrs. Frank.....	Piano	Bozeman
Young, Ethel.....	Piano	Bozeman

SUMMER QUARTER STUDENTS.

Adkins, Henry T.	Pony
Adkins, Katherine	Pony
Alexander, Violet	Medicine Lake
Alexander, Ann A.	Bozeman
Allphin, Mrs. Fred	Wilsall
Anderson, Jessie	Belfry
Anderson, Selma	Broadview
Antonsen, Bessie	Bozeman
Antonsen, Ruth	Bozeman
Armstrong, Irene	Knight, Wyo.
Aumack, Bessie	Le Fargo, Wis.
Aumack, Minnie	Le Fargo, Wis.
Bain, Lola	Joliet
Bannon, Ella	Lambert
Barr, A. Melea	Brockton
Bartlett, Nellie	Edmonton
Becker, Norma	Bozeman
Bennett Mary	Deer Lodge

Bertrand - Blanche	Roberts
Betz, Lillian	Vandalia
Birkland, Marie	Melstone
Black, William A.	Clasoil
Blinzler, Ida M.	Brockway
Boardson, Aldyth	Lambert
Bohart, Ruby	Bozeman
Bolinger, Marguerite	Chance
Boud, Avis,	Absarokee
Braden, Zelma	Terry
Bradley, Carrie	Livingston
Brandenburg, Hazel	Bole
Bristol, Florence	Great Falls
Brown, Carol J.	Savage
Brown, Hazel	Clyde Park
Brown, Helen	Box Elder
Brown, Mary	Clyde Park
Brown, Mrs. Mae	Park City
Caldwell, Beulah	Kalispell
Carrington, Roxy E.	Thurflow
Christianson, E. A.	Bozeman
Clary, Ruth V.	Bozeman
Clark, Louisa	Gopher
Cleary, Ann	Kalispell
Cohagen, Ora L.	Billings
Conant, Amy	Judith Gap
Condon, Montana	Livingston
Conors, Olga	Willard
Cooper, Verneice	Willow Creek
Courtney, Emma Pearl	Harrison
Crane, Eva B.	Loesch
Daily, Bessie	Pinto
Darnall, Angie	Miles City
Davis, Beryl	Neihart
Davis, Opal M.	Red Lodge
De Merice, Minnie	Amos
Denny, Ethel	Demers
Dixon, Mrs. Blanche M.	Bozeman
Dodge, Dorothy	Creston
Doerflinger, Lillie	Dunkirk, N. Y.
Duffey, Laura	Wolf Point
Dull, Irvin	Redley, Ind.
Dunlevy, Bess	Billings
Dusenberry, Inez	Rudyard
Eckstein, Mary E.	Bozeman
Ellis, Vera	Absarokee

Fitzgerald, Lucile	Collins
Fitzgerald, Anna	Elliston
Fisher, Ray E.	Bozeman
Ford, Anna	Stacy
Franklin, Muriel	Gopher
Gallagher, Nell E.	Glasgow
Gardner, Mary	Billings
Gates, Blanche	Livingston
Gill, Ellen	Bozeman
Groy, Lulah	Libby
Greenlaw, Una	Absarokee
Grinde, Frances	Spokane, Wash.
Griswald, Isla	Missoula
Gullard, Manda	Acton
Hagen, Bernice	Glasgow
Hall, Florence	Livingston
Hannon, Lois	Darby
Hanson, Mrs. E. F.	Simla
Harkins, Della L.	Ekalaka
Harpster, Grace G.	Ekalaka
Harris, Mrs. Cornelius	Castle Buttes
Henningsen, Elsie	Glasgow
Herrin, Jennie	Bozeman
Hess, Mary A.	Valley Town
Hiatt, Beatrice	Wheaton
Hiatt, Julia	Eureka
Higgins, Roxie	Bozeman
Hill, Belva	Townsend
Hines, Florence	Grain
Hines, Helen	Grain
Holdeman, Edw. E.	Belgrade
Holland, Bess	Salesville
Hoseman, Maydia B.	Denton
Houser, Miriam	Brusett
Howell, Bessie	Bozeman
Hubbard, Cassie	Ekalaka
Hubbard, Ina	Ekalaka
Huffman, Esther	Judith Gap
James, Herschel	Absarokee
Janskovitch, Mary A.	Bearcreek
Jarussi, Loretta	Columbus
Johnson, Lillian	Eureka
Jones, Irene Agnes	Bole
Kast, Mrs. Lizzie	Ridge
Kellams, Pearl	Bozeman
Kiehl, Reeta	Livingston

Kimper, Sadie	Manhattan
Kincaid, Lillian V.	Bozeman
Kindler, Leone	Columbus
Kyriss, Evelyn	Broadview
La Rowe, Alta	Circle
Larson, Bertina	Eureka
Larson, Doris M.	Bozeman
Lee, Beatrice	Eureka
Leibole, Nora	Paris
Letchworth, Hazel C.	Bozeman
Lewis, Charlotte	Glendive
Lingshire, Margaret W.	Watson
Lipson, Rebecca	Butte
Lipe, Rena B.	Acton
Lovely, Pearl	Clyde Park
Lowes, Louise	Bozeman
Lunstead, Edna	Willmar, Minn.
Lunstead, Ella T.	Kalispell
McCall, Nora	Valier
McCullough, Florence	Selway
McDonnell, Rose	Logan
McDonell, Rose	Ennis
McGrade, Isabel	Libby
McIntosh, Mrs. Zeta	Bozeman
McLees, Orla D.	Kingsley
McLeon, Mabel	Norris
McMahan, Millicent	St. Xavier
McMullen, Glenn W.	Pompey's Pillar
McNally, Margaret	Ballantine
McQuire, Golda	Kalispell
Mack, Mary G.	Harrison
Maes, Gertrude	Reedsburg, Wis.
Maes, Lloyd	Reedsburg, Wis.
Madsen, Emma J.	Roundup
Mahoney, Marguerite	Townsend
Marshall, Edna	Libby
Meece, Lona F.	Manhattan
Mickelberry, Nanabel	Bozeman
Miles, Daisy	Canton
Monahan, Marguerite	Clyde Park
Moore, Jennie	Columbus
Moore, Mabel	Bozeman
Morgan, Nan	Bozeman
Moyer, Elsie G.	Jordan
Moyer, Frank	Cohagen
Munyon, Daisy A.	Shepherd

Murane, Clara	Columbus
Murphy, Anne T.	Boulder
Murphy, Mary A.	Butte
Murray, Dulcie	Ogdensburg, Wis.
Murray, Emma	Ogdensburg, Wis.
Murray, Gladys,	Ogdensburg, Wis.
Murray, Lynabel	Ogdensburg, Wis.
Murray, Jean	Rudyard
Noble, Viva	Billings
Nowlan, Mary	Kalispell
Oppegaard, Dagney	Savage
Oravetz, Irene	Bozeman
O'Rourke, Anna	Boulder
Orth, Frances	Bozeman
Orvis, Elizabeth	Bozeman
Parent, Sarah	Malta
Peck, Ruth	Pony
Perrault, Helen	Sheridan
Peterson, Emily	Fremont, Neb.
Peterson, Ragma	Livingston
Piper, Essie L.	Absarokee
Platner, Catherine	Boyd
Quigley, Melda M.	Wyola
Ramsey, Alice	Clancy
Rash, Gladys D.	Reed Point
Raub, Helen	Sheridan
Ray, Anna	Billings
Redlingshafer, Nellie	Creston
Rice, Cecilia	Sandusky, Wis.
Robinson, Florence	Billings
Root, Anna	Bew
Rosenburg, Annie	Bozeman
Rosenthal, Elizabeth	Waterloo
Russel, Ruth B.	Bridger
Rustnen, Agnes	Kalispell
Schreibeis, Chas. D.	Bozeman
Schultz, Anna L.	Livingston
Schunk, Clara	Troy
Shwind, Meta	Selway
Scofield, Nellie	Darby
Scott, Aurelia	Bozeman
Sebilist, Ruth	Billings
Sheldon, Ethel C.	Kalispell
Shipstead, Ellen	Scobey
Short, Vallee E.	Topeka, Kan.
Simon, Esther G.	Bridger

Skank, Gladys	Bozeman
Smith, Irene	Helena
Smith, Lela	Reed Point
Smith, Lois	Bozeman
Smith, Marie	Boulder
Smith, Millie	Simla
Sodergren, Mary D.	Billings
Southwick, Lucy H.	Hamilton
Spaulding, Mina	Highwood
Stackhouse, Bertha	Troy
Steadman, Martha M.	Loesch
Steingruber, Martha M.	Willow Creek
Stevens, Marjorie	Pony
Stiff, Welda	Bozeman
Story, Mayo	Bozeman
Stretch, Hortense	Superior
Sundelius, Ellen	Kila
Swanson, Ruby	Troy
Swarvick, Mary H.	Boulder
Swenson, Hannah	Lakota, N. D.
Swenson, Eleanor	Lakota, N. D.
Tenneson, Arline	Whitefish
Terwilliger, Nina	Bozeman
Thomas, Russell	Bozeman
Torgenson, Blanche	Ethridge
Torrence, Helen H.	Billings
Torrence, Louise	Billings
Vandenhook, Clara	Columbus
Walker, Rebecca	Dixon
Walker, Esther Y.	Livingston
Walter, Hazel	Chance
Walpert, Eleanore	Great Falls
Ware, Ellen	Park City
Weaver, Marion	Belgrade
Welch, Christopher	Judith Gap
Weller, Mary	Hardin
West, Nell	Edmond, Okla.
Williams, Elizabeth	Intake
Williams, Twilla,	Bozeman
Wilson, Jean M.	Creston
Wilson, Sadie	Creston
Wing, Florence	Spokane, Wash.
Wolfgram, Hazel	Pompey's Pillar
Woodworth, Mrs. Marie	Somers
Woodworth, Theron	Somers
Wright, Marjorie	Sheridan

Yarborough, Minerva	Reeds, Missouri
Yarborough, Mildred	Reeds, Missouri
Yeatts, Fay	Beaverton
Yeatts, Ray	Beaverton
York, Mildred	Billings
Zieche, Mrs. Florence	Bew

FARMERS' WEEK.

Ahern, T. E.	Ringling
Ahern, Mrs. T. E.	Ringling
Alderson, Matt. W.	Helena
Anderson, Alfred E.	Christina
Anderson, A. D.	Sidney
Anderson, E. W.	Plentywood
Ashoy, S. F.	Hall
Atwood, Chester Ely	Valier
Axtell, C. E.	Salesville
Ayers, Augustine H.	Powell, Wyoming
Baker, George E.	Whitehall
Banker, Paul P.	Havre
Bennett, Mrs. R. L.	Wilsall
Benjamin, G. A.	Fairfield
Blair, Frank S.	Bozeman
Border, J. E.	Bozeman
Bos, John	Belgrade
Bridger, George T.	Brinkman
Brown, John W.	Roscoe
Brown, F. M.	Bozeman
Buttleman, Wm. H.	Willow Creek
Carpenter, Chester	Clyde Park
Catron, Henry M.	Bozeman
Chadwick, Hazelton M.	Valier
Cheney, Harold H.	Belgrade
Clark, Anna M.	New York City
Clegham, S. B.	Bozeman
Coctal, James	Helena
Coleman, Orville	Twin Bridges
Conner, R. M.	Poplar
Cook, E. R.	Twin Bridges
Cooke, Clara M.	Belgrade
Davis, Chester C.	Great Falls
Davis, R. E.	Willow Creek
Dhu'Ellis, S. Roderique	Wilsall

Doig, Walter L.	Sixteen
Duncan, Ray	Belgrade
Duncan, Scott	Belgrade
Duncan, W. J.	Missoula
Edwards, George F.	Lewistown
Eklund, Edwin G.	Minneapolis, Minn.
Elliott, Hereld W.	Salesville
Elliott, Mrs. Hereld.	Salesville
Elliott, Pauline	Salesville
Elliott, Mrs. S. F.	Salesville
Ely, Arthur	Sun River
Ewalt, J. W.	Ekalaka
Flannery, William F.	Toluca
Ford, A. D.	Belgrade
Foster, Inez	Missoula
Frank, Sol H.	Wilsall
Frohback, H. O.	Three Forks
Gallraiet, Malcolm M.	Livingston
Goldberg, Clarence F.	Hall
Gray, John W.	Cascade
Greenway, Charles T.	Bozeman
Gruar, John D.	Townsend
Harlan, W. B.	Como
Harrer, Henry	Belgrade
Haugland, O. O.	Bozeman
Higgins, William	Helena
Hockersmith, S. F.	Great Falls
Holgate, F. G.	Bozeman
Holgate, R. C.	Wilsall
Holmesland, Sam	Sun River
Howitt, Alexander	Harlowton
Hughes, Mrs. J. D.	Bozeman
Irvine, Wm. L.	Pipestone Springs
Jammerthat, Leo	Bozeman
Johns, A. M.	Wilsall
Johnson, Harold H.	Powell, Wyoming
Jones, Russell B.	Cascade
Jump, Charles M.	Powell, Wyoming
Junod, O. H.	Sheridan
Kelley, Jeanette	Columbus
Kendrick, Lois	Terry
Kenney, R. D.	Clyde Park
Koger, J. G.	Sun River
Kremer, John H.	Bozeman
Land, F. A.	Forest Grove
Lavalle, Peter F.	Valier

Lewis, Frank E.	Park City
Mackale, R. R.	Shelby
Madsen, H. P.	Archer
Mann, Mrs. Jane	Bozeman
Maryott, J. L.	Roberts
Maryott, Mrs. J. L.	Roberts
McSeer, J. W.	Bozeman
MacSpadden, F. E.	Great Falls
Mehlberg, Frank H.	Reed Point
Meyerhoff, E. F.	Forsyth
Mitchell, L. G.	Savage
Mitchell, R. P.	Salesville
Moore, Joseph E.	Bozeman
Moses, W. W.	Great Falls
Myrick, H. D.	Square Butte
Myrick, Mrs. H. D.	Square Butte
Neuman, Ernest W.	Heron
Nichols, George R.	Bozeman
Niebel, Mrs. Matt.	Bozeman
Norman, Hugo W.	Belgrade
O'Donnell, I. D.	Billings
O'Neill, Mrs. Mary	Billings
Paddox, T. C.	Leadville, Colo.
Page, Arthur	Whitehall
Page, Clara G.	Bozeman
Peets, John M.	Bozeman
Penwell, Florence	Belgrade
Penwell, M. W.	Belgrade
Penwell, Mrs. M. W.	Belgrade
Peterson, Palmer G.	Miles City
Platt, Percival T.	Como
Rasenow, August C.	Billings
Rassman, Joe	Manhattan
Rea, William	Clyde Park
Redlingshafer, J. W.	Kalispell
Reece, John D.	Bozeman
Reese, Mrs. Melva	Bozeman
Revo, Walter E.	Lambert
Revo, Mrs. Walter E.	Lambert
Roberts, Chester	Park City
Sands, C. H.	Devon
Sanders, James	Manson
Sanders, Mrs. J. C.	Manson
Sellick, Thomas J.	Billings
Snyder, W. E.	Glasston
Spring, L. H.	Hamilton

Stillman, A. Z.	Salesville
Stockton, Robert S.	Strathmore, Alberta, Canada
Stuart, J. W.	Drummond
Stucky, J. J.	Bozeman
Summer, File	Clyde Park
Taylor, Raymond	Cascade
Teagarden, Sam W.	Great Falls
TeSelle, Harry	Manhattan
TeSelle, Henry	Manhattan
Thornber, H.	Victor
Thorfinson, M. A.	Chinook
Tifield, R. H.	Ballantine
Tintinger, Thomas	Park City
Towne, N. L.	Bozeman
Van Horn, George	Bozeman
VanderSluis, James	Yakima, Wash.
Walton, John W.	Belgrade
Walton, Mrs. J. W.	Belgrade
Walrath, A. J.	Bozeman
Ward, Charles Earl	Salesville
Ward, Oliver L.	Salesville
Wayman, W. M.	Valier
Wayman, Mrs. W. M.	Valier
Wenz, Alfred	Aberdeen, S. D.
Westlake, L. D.	Bozeman
Wetzel, James I.	Cardwell
White, B. C.	Buffalo
Williams, Charles P.	Denver, Colo.
Willis, Mina A.	Billings
Wright, G. A.	Ballantine
Wright, Harold F.	Belgrade
Yergey, Stanley A.	Hardin

Summary of Registration

	1918-19			1919-20		
	Men	Women	Total	Men	Women	Total
College of Agriculture	41	0	41	102	0	102
College of Engineering	77	0	77	190	0	190
College of Applied Science	36	17	53	31	23	54
College of Household and Industrial Arts.....	18	141	159	24	149	173
School of Home Economics	0	13	13	0	17	17
School of Mechanic Arts	60	0	60	86	0	86
School of Agriculture	37	0	37	143	0	143
School of Music	4	58	62	23	90	113
Total	274	228	502	599	279	878
Summer Quarter	8	189	197	15	239	254
Farmers' Week.....	0	0	0	136	23	159
Total	282	417	699	750	541	1291
Students' Army Training Corps, Section "A"	203	0	203	0	0	0
Students' Army Training Corps, Section "B"	107	0	107	0	0	0
Total	592	417	1009	750	541	1291
Counted Twice	80	42	120	17	49	66
Grand Total.....	512	375	887	733	492	1225

SUMMARY BY COUNTIES AND STATES

Beaverhead County	10
Big Horn County	15
Blaine County	10
Broadwater County	18
Carbon County	33
Carter County	7
Cascade County	62
Chouteau County	16
Custer County	11
Dawson County	7
Deer Lodge County.....	14
Fallon County	3
Fergus County	31
Flathead County	33
*Gallatin County	333
Garfield County	9
Glacier County	2
Granite County	6
Hill County	18
Jefferson County	22
Lewis and Clark County.....	33
Lincoln County	18
McCone County	2
Madison County	27
Meagher County	10
Mineral County	1
Missoula County	13
Musselshell County	13
Park County	42
Phillips County	6
Pondera County	15
Powder River County.....	7
Powell County	9
Prairie County	4
Ravalli County	22
Richland County	12
Roosevelt County	11
Rosebud County	10
Sanders County	12
Sheridan County	11
Silver Bow County.....	24
Stillwater County	22
Sweet Grass County.....	8
Teton County	15

Toole County	10
Treasure County	5
Valley County	18
Wheatland County	11
Wibaux County	1
Yellowstone County	60
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Total Montana	1112
Other States	113
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Grand Total	1225

*Note.—The 333 students from Gallatin County were enrolled in the College as follows:

College Courses	156
Secondary Courses	32
School of Music.....	46
Summer Session	44
Farmers' Week	53

Alumni

With their Years, Degrees, and Present Addresses and Occupations.

- Abell, Tracy H., B. S., 1915; Instructor in Horticulture, Utah Agricultural College, Logan, Utah.
- Abrahamson, Irene, B. S., 1918; Instructor in Domestic Science, Bridger High School, Bridger, Montana.
- Alderson, Myrtle, B. S., 1913; Mrs. J. H. Griswold, Moiese, Montana.
- Allen, Elbert, B. S., 1903; Attorney, Livingston, Montana.
- Allen, Mollie, B. S., 1916; Mrs. R. L. Strand, Bozeman, Montana.
- Alward, Mary L., B. S., 1908; Y. M. C. A. work, 12'dAgnuesse, Paris, France.
- Annin, James T., B. S., 1911; Owner Columbus News, Columbus, Montana.
- Arneson, Harriet, B. S., 1918; Bank Clerk, Big Timber, Montana.
- Axtell, Lucy Alice, B. S., 1919; Teacher in High School, Shelby, Montana.
- Babbitt, Minnie, B. S., 1912; Instructor in Domestic Science, Raynesford, Montana.
- Baker, Florence, B. S., 1912; Deceased.
- Baker, Harold E., B. E. E., 1907; Supt. Electric Power Company, Naches, Washington.
- Bancroft, Raymond E., B. S., 1911; Horticultural Inspector, Billings, Montana.
- Barnard, Robert B., B. S., 1910; C., M. & P. S. R. R., Electrification Department, Seattle, Washington.
- Batch, Otto, B. S., 1916; Homesteader, Mitchell, Montana.
- Beerstecher, Ada, B. S., 1917; Graduate Student Johns Hopkins University, Baltimore, Maryland.
- Bell, James C., B. S., 1911; Oregon Agricultural College, Corvallis, Oregon.
- Benton, Ralph B., B. S., 1906; University of California, Berkeley, California.
- Blankenship, E. V., B. S., 1897; Real Estate, Bozeman, Montana.
- Blessing, John, B. S., 1912; Farmer, Pine View, Montana.
- Bole, Margaret, B. S., 1913; Printer, Bozeman Daily Chronicle Office, Bozeman, Montana.
- Bole, William S., B. S., 1906; Physician and Surgeon, Bozeman, Montana.
- Booker, Clinton T., B. S., 1911; Supt. Great Falls and Missouri River Substations, Montana Power Co., Great Falls, Montana.

- Border, Blanche, B. S., 1918; Mrs. Thomas Menke, Glendive, Montana.
- Border, Ernest, B. S., 1916; Farmer, Bozeman, Montana.
- Borthwick, Alberta, B. S., 1916; Home Demonstration Agent, Great Falls, Montana.
- Brabrook, Ralph, B. S., 1913; Directing Department, American Bridge Company, Chicago, Illinois.
- Breneman, Annie T., B. S., 1907; Instructor in Mathematics and Physics, Gallatin County High School, Bozeman, Montana.
- Brewer, Lucille, B. S., 1909; Assistant Professor of Home Economics, Cornell University, Ithaca, New York.
- Brook, Thomas B., B. S., 1913; Sheridan, Montana.
- Brooks, Roland, B. S., 1915; Boulder, Montana.
- Brown, Archie S., B. S., 1910; Electric Expert, U. S. Navy, Mare Island Navy Yards, San Francisco, California.
- Brown, Edith E., B. S., 1904; Mrs. John Milloy, Regina, Sask., Canada.
- Brown, Mary Holland; Mrs. Fred Brown, Bozeman, Montana.
- Buckley, Thomas W., B. S., 1914; Civil Engineer, Manhattan, Montana.
- Bull, Edna, B. S., 1909; Mrs. G. W. Kirscher, Townsend, Montana.
- Bull, Frieda M., B. S., 1907; M. S., 1909; Instructor in Mathematics, Montana State College, Bozeman, Montana.
- Bullock, Fred, B. S., 1917; Assistant, Grain Standardization Bureau, Minneapolis, Minnesota.
- Bunnell, Ercell, B. S., 1918; Mechanic, Bozeman, Montana.
- Bunnell, Marie, B. S., 1919; Instructor in Home Economics, Choteau, Montana.
- Burke, Edmund, B. S., 1907; Chemist and Meteorologist, Montana Agricultural Experiment Station, Bozeman, Montana.
- Burket, Alonzo D., B. S., 1915; Chemist, Three Forks Portland Cement Company, Trident, Montana.
- Butter, Donald, B. S., 1909; Electrical Engineer, General Electric Company, Schenectady, New York.
- Caldwell, Thomas O., B. A. C., 1899; Farmer, Lewistown, Montana.
- Cannon, Raymond E., B. S., 1917; Instructor in Agriculture, Deer Lodge, Montana.
- Carmichael, Effie, B. S., 1910; Mrs. Vergil A. Spicer, Red Oak, Iowa.
- Carr, Irene H., B. S., 1911; Mrs. Claude Meserve, North Bridgetown, Maine.
- Carr, M. L., B. S., 1917; Americanization Secretary, Y. M. C. A., Tacoma, Washington.
- Chaffee, Sarah, B. S., 1916; Mrs. Rudolph Beseke, Oakesdale, Washington.
- Chattin, Linnie, B. S., 1919; Mrs. Fred Bullock, 1801 2nd South St., Minneapolis, Minnesota.
- Chattin, Earl William, B. S., 1919; Big Timber, Montana.

- Chestnut, Lula, B. S., 1916; Instructor Home Economics, Powell County High School, Deer Lodge, Montana.
- Clark, Ben A., B. S., 1911; Farmer, Springdale, Montana.
- Clark, Grace, B. S., 1911; Missionary, Old Umtali, Rhodesia, Africa.
- Clark, Olive, B. S., 1913; Evergreen Apts., Bozeman, Montana.
- Clarkson, Robert, B. S., 1917; County Agent, Choteau County.
- Cockrel, Irvin, B. S., 1900; Osteopath Physician, 505 5th Ave., N. Y.
- Coffey, Hazel C., B. S., 1915; Graduate Student, Northwestern University, Evanston, Illinois.
- Cole, E. Lester, B. S., 1917; Associate Editor, Montana Farmer, Great Falls, Montana.
- Collins, Walter E., B. S., 1902; Attorney and Trust Officer, Daly Bank and Trust Company, Butte, Montana.
- Cook, Charles W., B. S., 1917; Board of Fire Underwriters, Butte, Montana.
- Cook, George, B. S., 1912; Lake Hamilton, Florida.
- Cooke, Amy, B. S., 1908; Mrs. George Ambrose, Mackey, Idaho.
- Cook, Donald H., B. S., 1917; Instructor in Chemistry, New Mexico Agricultural College, State College, New Mexico.
- Cooley, Esther Belle, B. S., 1916; Graduate Student, Columbia University.
- Cooley, George, B. S., 1919; Farmer, Bozeman, Montana.
- Cotner, Victor, B. S., 1916; Civil Engineer, Lovell, Wyoming.
- Cowan, Lewis, B. C. E., 1904; Civil Engineer, Milwaukee Ry., Bozeman, Montana.
- Cullum, Georgia, B. S., 1914; Mrs. George Roosevelt, Home Demonstration Agent, Gallatin County, Bozeman, Montana.
- Dahl, Hilmar, B. S., 1916; Mechanical Engineer, Wilkinsburg, Pennsylvania.
- Daly, Freeman, B. S., 1912; County Surveyor, Choteau, Montana.
- Danielson, Mary, B. S., 1918; Medical Student, University of Minnesota, St. Paul, Minnesota.
- Davidson, Lyndall, B. S., 1915; Chemist, A. C. M. Co., Anaconda, Montana.
- Davidson, Mary E., B. S., 1910; Office Clerk, Deaconess Hospital, Bozeman, Montana.
- Davidson, Paul Ballinger, B. S., 1919; Chemist for Cement Company, Trident, Montana.
- Davis, Russell Lowell, B. S., 1919; State College, Ames, Iowa.
- Dawes, Rhoda, B. S., 1913; Mrs. Arthur Seamans, Huntley, Montana.
- DeCamp, Renan, B. S., 1917; Montana Power Co., Wolf Creek, Montana.
- DeMuth, David R., B. S., 1910; Deceased.
- DeMuth, Maude S., B. S., 1907; Mrs. W. D Tallman, Bozeman, Montana.
- Donaldson, Noble C., B. S., 1912; Farmer, Glasgow, Montana.

- Douglas, Stanley D., B. S., 1913; Montana Power Co., Norris, Montana.
- Draper, Charles H., B. S., 1912; Editor and Owner Carbon County Journal, Red Lodge, Montana.
- Driscoll, W. J., B. S., 1908; Civil Engineer, Lawrence, Massachusetts.
- Drummond, Warren, B. S., 1918; Electrical Engineer. Minneapolis, Minnesota.
- Duquette, Jay, B. S., 1917; Wolf Creek Holter Dam, Wolf Creek, Montana.
- Dusenberry, Inez, B. S., 1912; Teacher, Chester Schools, Chester, Montana.
- Eames, Esther Minnie, B. S., 1919; Teacher of Home Economics, Moore, Montana.
- Eberle, Alfred, B. S., 1915; Manager, Dan C. McKay Stock Ranch, Kinsey, Montana.
- Eckles, Mildred A., B. S., 1914; Forsyth, Montana.
- Edsall, William, B. S., 1911; 94 South Oxford St., Brooklyn, New York.
- Edwards, Timothy, B. S., 1909; County Surveyor, Oro Fino, Idaho.
- Edwards, Margaret, B. S., 1912; Professor of Home Economics, Florida College for Women, Tallahassee, Florida.
- Ellis, Edward M., B. S., 1911; General Electric Co., Los Angeles, California.
- Emhoff, Elizabeth, B. S., 1918; Mrs. Lawrence Saltz, Anaconda, Montana.
- Erwin, James Kent, B. S., 1919; Bozeman, Montana.
- Everett, Inez, B. S., 1914; Mrs. Ed. Schimmele, 306 Oak Grove St., Minneapolis, Minnesota.
- Fisher, Charles M., B. S., 1908; Merchant, Bozeman, Montana.
- Fisher, Helen, B. S., 1910; Mrs. Fred Willson, Bozeman, Montana.
- Fiske, John M., B. S., 1915; General Electric Company, Yarmouth, Maine.
- Fitzgerald, James, B. S., 1919; Merchant, Bozeman, Montana.
- Flager, Harold J., B. E. E., 1907; 79 Milk Street, Boston, Massachusetts.
- Flager, Howard A., B. E. E., 1906; care Lindsay Food Co., Miles City, Montana.
- Flager, Ruth, B. S., 1910; Mrs. Carl Widener, Bozeman, Montana.
- Flaherty, Charles D., B. C. E., 1904; County Surveyor, Jefferson County, Whitehall, Montana.
- Flanders, Clara M., B. S., 1914; Mrs. William Vestal, 6015 Averrol Avenue, Oakland, California.
- Fletcher, Elizabeth M., B. S., 1916; Mrs. Emmett Riordan, Livingston, Montana.
- Flood, Marie, B. S., 1918; Mrs. Guy McCune, Victor, Montana.
- Ford, Arthur, B. S., 1916; 913 Cannon Street, Helena, Montana.
- Foster, Florence, B. S., 1896; Mrs. Burton Flemming, Iowa City, Iowa.

- Fowler, Edith E., B. S., 1917; Home Demonstration Agent, Cheyenne, Wyoming
- Fowler, Viola, B. S., 1915; Stenographer, Bozeman, Montana.
- Fox, Hazel, B. S., 1910; Mrs. Byram Mayfield, Enterprise, Oregon
- Fox, Arthur P., B. S., 1917; R F D 2, Kalispell, Montana
- Freeman, Beatrice B., B. S., 1900; Mrs. Thomas Davis, Absarokee, Montana.
- Freeman, William B., B. S., 1903; Consulting Engineer, Denver, Colorado.
- Froebe, Frank J., B. S., 1911; Supt. Montana Power Company Ranches, Helena, Montana.
- Gardiner, Henry C., B. S., 1903; Agriculturist, Anaconda Copper Mining Company, Anaconda, Montana
- Garvin, John P., B. S., 1917; Electrical Engineer, Helena, Montana
- Goodson, Anna, B. S., 1915; Mrs Glenn Willson, Bozeman, Montana.
- Gordon, Fred E., B. S., 1913; Montana Farming Corporation Agronomist, Hardin, Montana.
- Gottschalck, Carl, B. S., 1909; M. S., 1910; Instructor in Chemistry, North Dakota Agricultural College, Fargo, North Dakota.
- Graves, Nelson, Fisk, B. S., 1919; Instructor in Agriculture, Belt High School, Belt, Montana.
- Gray, David, B. S., 1919; Deceased.
- Gray, Florence E., B. S., 1915; Teacher, St Maries, Idaho.
- Gray, Helen, B. S., 1918; Instructor in Home Economics, Libby, Montana
- Gray, Wilson, B. S., 1915; Rancher, Choteau, Montana.
- Gray, John Wright, B. S., 1917; Cascade, Montana.
- Greene, Mrs Gladys Leckliter, B. S., 1919; Missoula, Montana.
- Griffith, Warren J., B. E. E., 1907; Chief Electrician, Clemmer Theater, Spokane, Washington.
- Grimes, W. Walter, B. S., 1915; Helena, Montana.
- Hagerman, Edna, B. S., 1912; Mrs. P. A. Heimlich, 1604 Central Ave., Great Falls, Montana
- Haines, William T, B S., 1911; 713 Sterling Place, Brooklyn, New York.
- Hagen, Roy, B. S., 1918; Electrical Engineer, 104 Jay Street, Schenectady, New York.
- Hall, Medra, B. S., 1918; Instructor in Home Economics, Fort, Benton, Montana.
- Haller, Beulah, B. S., 1918; Mrs. Charles Cook, Butte, Montana.
- Ham, Frank W., B. S, 1903; M. S., 1905; Professor of Physics, Montana State College, Bozeman, Montana.
- Hamilton, Everett A., B. S., 1911; Supt. Madison River Power Company, Norris, Montana.
- Hansen, Charles L., B. S, 1914; Deceased.

- Hansen, Waldemar, B. S., 1917; Chemist, State University, Iowa City, Iowa
- Harmon, Ella M., B. S., 1914; Home Demonstration Agent, Pendleton, Oregon.
- Hartman, Brooke, B. S., 1913; Banker, Lewistown, Montana.
- Hartman, June, B. S., 1910; Instructor in Music, Montana State College, Bozeman, Montana.
- Hartman, Lios K., B S., 1907; Teacher of Spanish, High School, Millen Apartments, Tacoma, Washington.
- Hartman, Ruth, B S, 1913; Mrs. Harley Hall, Neihart, Montana.
- Hartman, Will, B. S., 1908; Civil Engineer, Livingston, Montana.
- Hawkins, P. H., M. S., 1903; Banker, Absarokee, Montana.
- Haynes, Etta V., B. S., 1919; Instructor Home Economics, East Helena High School, East Helena, Montana.
- Heagenney, Wm. F., B. S., 1916; Field Agriculturist, Great Western Sugar Beet Company, Lovell, Wyoming.
- Heighton, Pearl A., B. S., 1914; Mrs. D. B. Roll, Billings, Montana.
- Helstrom, Carl, B. S., 1918; Civil Engineer, Livingston, Montana.
- Henderson, Charles F., B. S., 1910; Westinghouse Electric Company, Pittsburg, Pennsylvania.
- Henderson, Lisle, B. S., 1909; Montana Power Company, Butte, Montana.
- Higgins, Lucille, B. S., 1911; M. S., 1912; Mrs. S. W. Norton, Jr., Teacher, High School, Spokane, Washington.
- Hill, Lewis L., B. S., 1914; Yellowstone Park.
- Hind, Bert S., B. S., 1909; Supt. Montana Power Plant, Thompson Falls, Montana.
- Hinman, Ruth, B. S., 1912; Teacher, Kalispell High School, Kalispell, Montana.
- Hodgskiss, John E., B. S., 1912; M. S., 1913; Farmer, Choteau, Montana.
- Hodgskiss, Ursula, B. S., 1917; Deceased.
- Hodgskiss, William L., B. S., 1912; Farmer, Choteau, Montana.
- Hodgskiss, Ruby, B. S., 1918; Teacher, Home Economics, Butte Junior High School, Butte, Montana.
- Hollier, Georgia, B. S., 1915; Mrs. Fred Benedict, Bremerton, Washington.
- Holst, John H., M. A., 1918; Principal Secondary Schools and Director Summer Session, Bozeman, Montana.
- Homann, Fred C., B. S., 1916; Instructor in Machine Work, Montana State College, Bozeman, Montana.
- Humphrey, Leo Chandler, B. S., 1919; Instructor in Chemistry and Assistant State Board of Health Water and Sewage Laboratory, Montana, State College, Bozeman, Montana.
- Hutton, Fred, B. E. E.; Deceased.

- Ingram, Craig, B. S., 1917; Electrical Engineer, 237 Spencer St., Helena, Montana.**
- Ingram, Doris, B. S., 1919; Teacher of Home Economics, Red Lodge, Montana.**
- Jackson, Joel, B. S., 1917; Farmer, Harrison, Montana.**
- Jacobs, Edward B., B. S., 1916.**
- Jacobs, Lillian, B. S., 1910; Mrs. Arie DeGroot, Three Forks, Montana.**
- Jaeckel Carl, B. S., 1917; Box 156, Geneva, Alabama.**
- James, John S. B. S. 1909; Engineer, Montana Reservoir and Irrigation Company, Cascade, Montana.**
- Jones, Burle, B. S., 1904; Nevada City, Nevada.**
- Jones, Kyle, B. S., 1912; Principal of High School, White Sulphur Springs, Montana.**
- Jones, Ray S., B. S., 1915; Assistant Chemist, Experiment Station, Bozeman, Montana.**
- Jones, Wyatt Wagner, B. S., 1901; M. S., 1902; Plant Pathologist for American Smelting and Refining Co., Salt Lake City, Utah.**
- Johnson, Martha, B. S., 1918; Mrs. John Haynes, Clancy, Montana.**
- Jorgenson, Ralph, B. S., 1917; Stockman, Fox, Montana.**
- Kearns, Katherine, B. S., 1919; Teacher Home Economics, Townsend, Montana.**
- Kelley, Martin, B. S., 1916; Assistant City Engineer, 313 W. 3rd Street, Anaconda, Montana.**
- Kelley, Jeanette, B. S., 1917; Home Demonstration Agent, Stillwater County, Columbus, Montana.**
- Kelley, Jean, B. S., 1919; Student, Chicago University, Chicago, Ill.**
- Kenck, Max W., B. S., 1914; Farmer Silverbow, Montana.**
- Kennard, Eveleen M., B. S., 1915; Mrs. Alfred Eberle, Kinsay, Montana.**
- Kennedy, Cyril C., B. S., 1910; Deceased.**
- Kiefer, James A., B. S., 1914; Assistant Professor in Physics, Montana State College, Bozeman, Montana.**
- Kimpton, Addie, B. S., 1910; Mrs. Jas. H. Conrad, Wilsall, Montana.**
- King, Lowell, B. S., 1904; Construction Engineer, Davenport, Iowa.**
- King, Ruby E., B. S., 1909; Mrs. George Hogan, Musselshell, Montana.**
- King, Willard V., B. S., 1910; Assistant Entomologist, U. S. Bureau of Entomology, New Orleans, Louisiana,**
- Kinney, Edward C., B. C. E., 1907; U. S. Reclamation Service, Dixon, Montana.**
- Kinsella, Olive, B. S., 1916; Teacher, Bowman, North Dakota.**
- Kirk, Grace, B. S., 1911; Mrs. Archie Campbell, 119 Drexel Apts., Haight Street, San Francisco, California.**
- Kirk, Mary E., B. S., 1906; Deceased.**
- Kirscher, W. Guy, B. S., 1909; Manager of Flour Mill, Townsend, Montana.**

- Knott, Georgia Frances, B. S., 1919; Teacher in Home Science, Junior High School, Bozeman, Montana.
- Kneale, Morris T., B. S., 1918; Farmer, Ballantine, Montana.
- Koch, Elers, B. S., 1901; Supervisor Forest Service, Missoula, Montana.
- Kountz, Josephine, B. S., 1918; 3rd Ave., Long Beach, California.
- Kremer, William J., B. S., 1910; General Manager Pine View Irrigation Company, Ennis, Montana.
- Kretlow, Mary P., B. S., 1917; Mrs. Thorwald Carlson, Hyland Apts., Salt Lake City, Utah.
- Kuhns, Myrtle, B. S., 1918; Instructor in Home Economics, Big Timber, Montana.
- Ladenburg, Carl, B. S., 1917; 837 Holland Ave., Electric Co., Wilkesburg, Pennsylvania.
- Lamme, Maurice A., B. S., 1903; Director of Geology and Mineralogy, Government University, Montevideo, Uruguay, South America.
- Langohr, Don., B. S., 1918; Florist, Bozeman, Montana.
- Langohr, Louise, B. S., 1918; Nurse, Murray Hospital Butte, Montana.
- Lannin, Earl A., B. S., 1912; Electrical Engineer, Bozeman, Montana.
- Leinard, Ford B., B. S., 1914; Farmer, Edwards, Montana.
- Lescher, Taylor, B. S.; General Electric Co., 837 Holland Avenue, Wilkesburg, Pennsylvania.
- Lessel, Erma, B. S., 1916; Mrs. R. A. Collins, Hardin, Montana.
- Lewis, Edna, B. S., 1903; 530 Spruce Avenue, Berkeley, California.
- Linfield, Bertil, B. S., 1917; Assistant in Land Classification, U. S. Geological Survey, Washington, D. C.
- Linfield, Azalea R., B. S., 1919; Instructor in Home Economics, Conrad, Montana.
- Livingston, Walter, B. S., 1910; Assistant Engineer, Milwaukee Ry., Miles City, Montana.
- Locke, Jerome G., B. C. E., 1908; Livingston, Montana.
- Lorentz, Floyd S., B. E. E., 1907; E. E., 1910; 1711 7th Ave. North, Electrician, A. C. M. Co., Great Falls, Montana.
- Lott, Mortimer J., B. S., 1915; Farmer, Twin Bridges, Montana.
- Lund, Janelle E., B. S., 1917; Mrs. B. W. Whitlock, 412 E. Howell S., Seattle, Wash.
- Lund, Helen, B. S., 1918; Artist in Entomology Department, Montana Experiment Station, Bozeman, Montana.
- Luther, Edith W., B. S., 1917; Deceased.
- Luther, Glenn, B. S., 1912; Ruby, Montana.
- McCabe, John, B. S., 1918; General Electric Co., 837 Holland Ave., Wilkesburg, Pennsylvania.
- McCone, Alice, B. S., 1918; Mrs. Mark Farris, 518 No. Broadway, Billings, Montana.

- Mackay, Warren, B. S., 1913; Draughtsman, A. C. M. Co., Anaconda, Montana.
- McElwee, James, B. S., 1919; 340 Mohawk Ave., Scotia, N. Y.
- McVey, Chester L., B. S., 1919; General Electric Co., Schenectady, N. Y.
- Malsor, Roy E., B. S., 1915; Civil Engineer, Townsend, Montana.
- Manning, J. W., B. S., 1917; County Agricultural Agent, Helena, Montana.
- Martin, Claude A., B. S., 1914; Civil Engineer, Box 1033, Butte, Montana.
- Maynard, Edna, B. S., 1900; M. S., 1903; Mrs. Garfield T. Morris, Alameda, California.
- Metheney, Blanche, B. S. 1911; Mrs. Ralph Kuschke, Sheridan, Wyoming.
- Miewald, Ethel, B. S., 1916; Chinook, Montana.
- Milburn, Geo. R., B. S., 1916; Civil Engineer, Butte, Montana.
- Millegan, Homer D., B. S., 1914; Farmer and Stockgrower, Millegan, Montana.
- Millegan, Guy J., B. S., 1912; Farmer, Millegan, Montana.
- Milnor, Estelle, B. S., 1917; Teacher, Aberdeen Washington.
- Mills, Dorothy Canning, B. S., 1919; Instructor in Home Economics, Deer Lodge, Montana.
- Monforton, Zoe, B. S., 1901; Mrs. H. C. Patterson, Pasadena, California.
- Monforton, Lucille, B. S., 1919; Instructor Home Economics, Belt, Montana.
- Monson, William, B. S., 1917; Deceased.
- Moore, Ellie J., B. S., 1901; Farmer and Insurance Agent, Bozeman, Montana.
- Morgan, Carl F., B. S., 1915; Farmer, Joliet, Montana.
- Morgan, George W., B. S., 1912; Assistant in Dry Land Agriculture, U. S. Department of Agriculture, Havre, Montana.
- Morgan, Joseph D., B. S., 1912; Assistant Grain Standardization Bureau, U. S. Department of Agriculture, Kansas City, Missouri.
- Morgan, Oliver P., B. S., 1896; Deceased.
- Morris, Harry Elwood, B. S., 1909; Assistant Botanist and Bacteriologist, Experiment Station, Bozeman, Montana.
- Morris, Garfield T., B. C. E.; Senior Civil Engineer in the Valuation Department, Inter-State Commerce Commission, Pacific Division, Alameda, California.
- Mountjoy, Agnes, B. S., 1907; Mrs. Harry Mickelson, Opheim, Montana.
- Mountjoy, Irvin, B. E. E., 1908; Farmer, Cardwell, Montana.
- Muntzer, Henry Philip, B. S., 1919; Electrical Engineer, Butte, Montana.

- Myers, Ada Mae, B. S., 1915; Mrs. Jay Jacobs, 132 Wyoming Ave., Billings, Montana.
- McCormick, C. S., B. S., 1916; Instructor in Agriculture, Helena Schools, Helena, Montana.
- McGraw, John L., B. S., 1912; Deceased.
- McIver, Grace F., B. S., 1917; Stenographer, 115 11th Ave. So., Great Falls, Montana.
- McSpadden, F. E., B. S., 1917; County Agricultural Agent, Great Falls, Montana.
- Nash, Lewis, B. S., 1904; Farmer, Bozeman, Montana.
- Noble, Edward G., B. S., 1915; Superintendent of Experiment Station, Investigating Southern Crops, Yuma, Arizona.
- Noble, Erma, B. S., 1909; M. S., 1910; Mrs. L. McCarthy, Bozeman, Montana.
- Noble, Ruth A., B. S., 1917; Mrs. E. E. Dawson, 1510 5th Ave. N., Great Falls, Montana.
- Noble, Florence, B. S., 1918; Instructor in Art, Gallatin County High School, Bozeman, Montana.
- Noble, Daniel Bohan, B. S., 1919; Instructor in Agriculture, High School, Hamilton, Montana.
- Norcutt, Etta Viola, B. S., 1919; Instructor of Home Economics, High School, Kalispell, Montana.
- Nordquist, Clark B. S., 1917; Bozeman, Montana.
- Norris, Earl B. S., 1919; Instructor in Chemistry, Montana State College, Bozeman, Montana.
- O'Connor, William, B. S., 1916; Farmer, Red Lodge, Montana.
- O'Connor, Frank, B. S., 1918; Farmer, Red Lodge, Montana.
- Osborne, Belle, B. S., 1907; Mrs. D. E. Fish, Mount Pleasant, Iowa.
- Osenberg, Albert, B. S., 1916; U. S. Dept. of Agriculture, Washington, D. C.
- Papke, William C., B. S., 1915; Farmer, Bozeman, Montana.
- Pease, Jay L., B. S., 1907; Farmer, Bozeman, Montana.
- Peck, Harry S., B. S., 1911; Electrical Engineer, C. M. & St. P. R. R., Seattle, Wash.
- Penwell, Clyde C., B. S., 1906; B. E. E., 1907; Montana Power Company, Great Falls, Montana.
- Penwell, Clyde W., B. E. E., 1907; Farmer, Vaughn, Montana.
- Perring, Maude Virginia, B. S., 1919; Instructor in Home Economics, Malta, Montana.
- Peters, Orville S., B. S., 1909; E. E., 1912; Assistant Physicist, Bureau of Standards, Washington, D. C.
- Peterson, Jas. A., B. S., 1909; Lawyer, 1322 Capital Avenue, St. Paul, Minnesota.
- Pettigrew, Leslie R., B. S., 1915; Forest Produce Laboratory, Madison, Wisconsin.

- Philpott, June, B. S., 1911; M. S., 1912; Teacher, 1160 Libert St., Salem, Oregon.
- Piedalue, Amee M., B. S., 1915; Stenographer, Bozeman, Montana.
- Piedalue, Laura, B. S., 1912; Instructor in Home Economics, Helena High School, 49 Helena Apts., Helena, Montana.
- Piedalue, Irene M., B. S., 1911; Social Service Work, Spokane, Wash.
- Pippinger, Harold, B. S., 1918; 811 Holland Ave., Wilksburg, Pennsylvania.
- Pool, Florence E., B. S., 1916; Extension Department, Pullman, Washington.
- Pool, Louis K., B. S., 1910; City Engineer, Townsend, Montana.
- Pope, Alger, B. S., 1918; with Parkes' Engineering Company, Ashdown, Arkansas.
- Potter, Ermine L., B. S., 1906; Professor of Animal Husbandry, Oregon Agricultural College, Corvallis, Oregon.
- Potter, John V., B. S., 1915; Westinghouse Electric Co., Springfield, Massachusetts.
- Potter, Charles Edward, B. S., 1919; Bozeman, Montana.
- Prentiss, Earl Henry, B. S., 1919; 104 Jay St., General Electric Co., Schenectady, N. Y.
- Quaw, Eugene, B. S., 1911; Apt. 7, Phinelanders Apts., 534 W. 127th St., New York City, N. Y.
- Quaw, Lucile, B. S., 1903; Teacher of English, Broadwater County High School, Townsend, Montana.
- Quaw, Mignon, B. S., 1902; Assistant State Leader of Home Demonstration Agents, Bozeman, Montana.
- Quaw, Thomas B., B. S., 1907; Goodyear Rubber Co., Akron, Ohio.
- Quaw, Marjorie, B. S., 1918; Instructor in Applied Art, Montana State College, Bozeman, Montana.
- Rapatz, Eugene, B. S., 1917; Montana Power Company, Great Falls, Montana.
- Reddick, Theodore, B. S., 1918; Farmer, Fruitvale, South Dakota.
- Reese, Herbert J., B. S., 1904; 1460 Dana, Los Angeles, California.
- Richter, Frederick A., B. S., 1914; Madison Power Co., Madison, Wisconsin.
- Riddell, Marsa, B. S., 1916; House Director, M. S. C., Bozeman, Montana.
- Ritz, Gladys, B. S., 1918; Chemist, Galen, Montana.
- Robinson, J. W. B. S., 1908; Grain Buyer for International Milling Company, Minneapolis, Minnesota.
- Roecher, Rausie, B. S., 1914; Mrs. Selmer Solberg, Big Timber, Montana.
- Romney, G. Ott, B. S., 1916; with Salt Lake Herald, Salt Lake City, Utah.
- Ronne, Edwin M., B. S., 1917; Rancher, Zurich, Montana.

- Rothwell, Howe, B. S., 1918; Civil Engineer, Columbus, Montana.
- Ross, Thomas, B. S., 1918; Rancher, Chinook, Montana.
- Rowe, Mary, B. S., 1918; Mrs. S. Hieronymus, Hardin, Montana.
- Sacket, Nathalie, B. S., 1913; Teacher High School, Livingston, Montana.
- Sacket, Chas. T., B. C. E., 1904; C. E., 1907; Civil Engineer, Livingston, Montana.
- Sales, Reno H., B. S., 1898; Geologist, Anaconda Copper Mining Company, Butte, Montana.
- Saltz, Lawrence W., B. S., 1917; Chemist, A. C. M. Co., Anaconda, Montana.
- Schabarker, W. W., B. M. E., 1902; Night Foreman, Shops Milwaukee Railroad, Milwaukee, Wisconsin.
- Schmit, F. W., B. S., 1903; Mining Engineer, Sao Paulo, Brazil.
- Scholten, Henry, B. S., 1917; Chemist, Big Timber, Montana.
- Schumacher, F. W., B. S., 1917; Farmer, R. F. D. No. 1, Deer Lodge, Montana.
- Scott, Parke T., B. S., 1917; Farmer, Armstead, Montana.
- Scott, Samuel, B. S., 1919; with A. C. M. Co., Anaconda, Montana.
- Seamans, Arthur, B. S., 1913; U. S. Government Experiment Service, Huntley, Montana.
- Seamans, Howard L., B. S., 1916; Special Field Agent for Montana Bureau of Entomology, U. S. D. A., Bozeman, Montana.
- Senz, Melvin, J., B. S., 1919; with A. C. M. Co., Anaconda, Montana.
- Sewell, Gordon, B. S., 1918; with A. C. M. Co., Anaconda, Montana.
- Shaw, W. T., B. S., 1896; Unknown.
- Shovell, W. L., B. S., 1912; Horticultural Expert, Hamilton, Montana.
- Sloan, J. Harvey, B. C. E., 1903; 1745 Conway Bldg., Chicago, Illinois.
- Sloan, W. F., B. E. E., 1903; 1745 Conway Bldg., Chicago, Illinois.
- Sloan, Wm. Glenn, B. S., 1910; Government Drainage Engineer, Boise, Idaho.
- Smith, Alda, B. S., 1913; Mrs. Harold Clay, Charlotte, Michigan.
- Smith, Inez, B. S., 1916; Instructor in Home Economics, Gallatin County High School, Bozeman, Montana.
- Smith, Robert Bashford, B. S., 1919; Instructor in Agriculture, Phillipsburg, Montana.
- Snider, Leta, B. S., 1911; Mrs. James A. Peterson, 1322 Capital Ave., St. Paul, Minnesota.
- Snow, Manfred L., B. S., 1917; 412 E. Havell St., Apt E., Seattle, Washington.
- Solberg, Selmer H., B. S., 1914; Merchant, Big Timber, Montana.
- Solberg, Stella, B. S., 1919; Instructor Home Economics, Virginia City, Montana.
- Soper, Joseph, B. S., 1913; Poultry Farm, Chola Vista, California.
- Spain, J. Marvin, B. S., 1911; Homesteader, Edwards, Montana.
- Spain, Whitfield, B. S., 1909; Manager of Ranch, Belgrade, Montana.

- Spragg, Frank A., B. S. A., 1902; Plant Breed of Farm Crops, Michigan Experiment Station, East Lansing, Michigan.
- Stadler, Marie, B. S., 1916; Mrs. John P. Cowan, Orono, Maine.
- Stafford, Lucy B., B. S., 1896; Mrs. William Peck, Pony, Montana.
- Stahlford, Ruby, B. S., 1917; Instructor in Home Economics, Three Forks, Montana.
- Stanley, Amelia, B. S., 1916; Assistant in Home Economics, Great Falls High School, Great Falls, Montana.
- Stanley, Ernest, B. S., 1919; Graduate Student, M. S. C., Bozeman, Montana.
- Steel, David, B. S., 1916; Water Inspector for G. N. R. R., Minot, North Dakota.
- Steel, Hamilton, B. S., 1915; Deceased.
- Stranahan, Clinton, B. S., 1918; Rancher, Fort Benton, Montana.
- Strand, A. Leroy, B. S., 1917; Special Field Agent for Montana Bureau of Entomology, U. S. D. A., Bozeman, Montana.
- Streets, Rubert, B. S., 1918; Assistant State Leader of Barberry Eradication, Bureau of Plant Industry, Bozeman, Montana.
- Swan, Ulmont, B. S., 1918; Electrical Engineer, 2000 Lowell Ave., Butte, Montana.
- Sweat, Ruth, B. S., 1916; County Superintendent, Teton County, Choteau, Montana.
- Switzer, Madge, B. S., 1914; Instructor in Home Economics, Gallatin County High School, Bozeman, Montana.
- Travener, Frank, B. C. E., 1903; Consulting Engineer, Missoula, Montana.
- Taylor, Emma, B. S., 1915; 311 West Windsor Road, Glendale, California.
- Taylor, John C., B. S., 1912; Acting County Agent Leader, Bozeman, Montana.
- Taylor, Horace Dale, B. S., 1919; Rancher, Craig, Montana.
- Thomas, David, B. S., 1917; Engineer, Valier, Montana.
- Thompson, A. Paul, B. S., 1915; First Assistant Chemist, Electrolytic Zinc Plant, Great Falls Reduction Works, Anaconda Copper Mining Company, Great Falls, Montana.
- Thompson, Homer C., B. S., 1902; President Three Valleys Cooperative Association, Three Forks, Montana.
- Thorpe, Elizabeth, B. S., 1907; Teacher, Westwood, California.
- Thorpe, Mabel A., B. S., 1907; Mrs. Joseph A. Thaler, Bozeman, Montana.
- Tracy, Edna B., B. S., 1908; Mrs. John White, Bozeman, Montana.
- Tremper, Wm. G., B. S., 1911; Civil Engineer, Butte, Montana.
- Truitt, C. Alonzo, B. S., 1915; Civil Engineer, Halden, Montana.
- Truman, Ida R., B. S., 1917; Bozeman, Montana.

- Truman, Joseph K., B. S., 1913; Electrical Engineer, Montana Power Company, Canyon Ferry, Montana.
- Undem, Louis, B. S., 1917; Rancher, Bozeman, Montana.
- Vestal, Wm. B., B. S., 1914; Engineer, 6015 Avenal Ave., Oakland, California.
- Vreeland, Edna, B. S., 1909; Mrs. Robt. K. Plues, Los Angeles, California.
- Wade, Arthur M., B. S., 1911; Three Forks, Montana.
- Walchli, Fred, B. S., 1919; Mechanical Engineer, Hardin Power Plant, Hardin, Montana.
- Walker, Cecil, B. S., 1916; Mrs. Walter Willson, Tucson, Arizona.
- Waterman, Marie L., B. S., 1919; Teacher in Domestic Science, White Sulphur Springs, Montana.
- Webster, Alden, B. S., 1914; Electrical Draftsman, Corps of Engineers, U. S. Army, Washington, D. C.
- Wells, Roscoe, M. S., 1917; Special Agent in U. S. D. A., Bureau of Entomology, Dallas, Texas.
- Werre, Harold Moritz, B. S., 1919; Rancher, Glasgow, Montana.
- Wharton, John C., B. S., 1913; Stockman, Wisdom, Montana.
- Whipple, Chas. A., B. S., 1917; Helena, Montana.
- Whiteside, John, B. S., 1917; Deceased.
- Widener, Carl C., B. S., 1908; City Engineer, Bozeman, Montana.
- Wilcomb, Maxwell J., B. S., 1915; Assistant City and County Engineer, Livingston, Montana.
- Wilcox, Guy M., B. S., 1917; Farmer, Dupuyer, Montana.
- Willey, Leroy, B. S., 1913; Farmer and Stockman, Wisdom, Montana.
- Williams, Frank B., B. M. E., 1899; Engineer, State School of Deaf and Blind, Boulder, Montana.
- Williams, Roy B., B. S., 1911; Civil Engineer, U. S. R. S., Great Falls, Montana.
- Williams, Sidney A., B. S., 1911; Electrical Engineer, H. J. Heinz Company, Pittsburg, Pennsylvania.
- Williams, Lee, B. E. E., 1902; County Surveyor and City Engineer, Deer Lodge, Montana.
- Willson, Walter G., B. S., 1913; Westinghouse Electrical and Mfg. Co., Tucson, Arizona.
- Wilson, Elva B. S., 1909; Mrs. N. P. Nelson, Three Forks, Montana.
- Wilson, Kathleen, B. S., 1915; Mrs. David Steel, Minot, North Dakota.
- Wolpert, Harold E., B. S., 1912; Deceased.
- Wylie, Lawrence, B. S., 1913; Electrical Engineer, Majestic Hotel, Seattle, Washington.
- Wylie, Mary, B. S., 1910; 1008 10th Avenue, Lewiston, Idaho.
- Young, Mrs. Verna T., B. S., 1915; Deceased.

SCHOOL OF PHARMACY ALUMNI

Note—School of Pharmacy transferred to the State University in 1913.

- Allen, Edgar Warren, Ph. C., 1910; Proprietor Red Lodge Drug Co., Red Lodge, Montana.
- Burfiend, Henry C., Ph. C., 1912; Proprietor City Drug Store, Dillon, Montana.
- Conard, Blanche (Mrs. L. L. Johnson), Ph. C., 1910; Orofino, Idaho.
- Cox, Harvey H., Ph. C., 1910; Proprietor, Cox-Poetter Drug Co., Bozeman, Montana.
- Crosby, Spencer J., Ph. C., 1911; Pharmacist, Anaconda, Montana.
- Drinville, James, Ph. C., 1910; Pharmacist, Deer Lodge, Montana.
- McCarthy, Rae, Ph. C., 1911 (Mrs. E. H. Williams); Helena, Montana.
- Mitchell, Paul L., Ph. C., 1909; Pharmacist, Kansas City, Mo.
- Morris, Abbie F., Ph. C., 1911; Pharmacist, Merced, California.
- Valentine, Charles P., Ph. C., 1910; Pharmacist, Helena, Montana.
- Young, Earl, Ph. C., 1910; Pharmacist, Great Falls, Montana.

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1920-1921

ANNOUNCEMENTS FOR
1921-1922

BOZEMAN, MONTANA
MAY, 1921

Entered at Bozeman, Montana, as Second Class Matter Under Act of Congress
August 24, 1912.

THE UNIVERSITY OF MONTANA

EDWARD C. ELLIOTT, Chancellor of the University.

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, Approved March 14, 1918, (effective July 1, 1918).

The general control and supervision of the University are vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

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| 3—Agricultural Hall | 16—Sheep Barn and Piggery |
| 4—Hamilton Hall | 17—Feeding Barn |
| 5—Engineering Laboratory | 18—Granary |
| 6—Cement Laboratory | 19—Cattle Barn |
| 7—Heating Plant | 20—Poultry House |
| 8—Shops | 21—Veterinary Building |
| 9—Gymnasium and Drill Hall. | 22—Club House |
| 10—Barracks | 23—Horse Barn |
| 11—Men's Dormitory | 24—Tennis Court for Women |
| 12—Horticultural Greenhouse | 25—Tennis Courts |
| 13—Biology Building | |

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1921							1922							1922							1923						
JULY							JANUARY							JULY							JANUARY						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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17	18	19	20	21	22	23	22	23	24	25	26	27	28	16	17	18	19	20	21	22	21	22	23	24	25	26	27
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DECEMBER							JUNE							DECEMBER							JUNE						
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25	26	27	28	29	30	31	25	26	27	28	29	30		24	25	26	27	28	29	30	24	25	26	27	28	29	30

Calendar

1921-1922

SPRING QUARTER

1921

March 26, Saturday	Registration Day
March 28, Monday	Instruction Begins
May 7, Saturday.....	Standing of Students Reported
May 30, Monday	Memorial Day, a Holiday
June 12, Sunday	Baccalaureate Address
June 15, Wednesday	Commencement
June 15-17, Wednesday-Friday.....	Examinations

SUMMER QUARTER

June 20, Monday	First Term Begins
July 4, Monday.....	Independence Day, a Holiday
July 29, Friday	First Term Ends
August 1, Monday.....	Second Term Begins
September 2, Friday.....	Second Term Ends

AUTUMN QUARTER

September 23, Friday.....	Meeting of the College Faculty
September 26,27, Monday-Tuesday.....	Registration Days
September 28, Wednesday.....	Instruction Begins
November 12, Saturday	Standing of Students Reported
November 24, Thursday.....	Thanksgiving Day, a Holiday
December 20-22, Tuesday-Thursday.....	Examinations and Registration
December 22, Thursday, Noon.....	Quarter Ends; Christmas Recess Begins

1922

WINTER QUARTER

January 3, Tuesday.....	Registration of New Students
January 3, Tuesday.....	Christmas Recess Ends; Instruction Begins
January 9-14, Monday-Saturday.....	Farmers' Week
February 11, Saturday.....	Standing of Students Reported
March 8-11, Wednesday-Saturday.....	Interscholastic Basketball Tournament
March 22-24, Wednesday-Friday.....	Examinations and Registration
March 24, Friday.....	Closing Exercises of School of Agriculture

SPRING QUARTER

March 25, Saturday	Registration Day
March 27, Monday.....	Instruction Begins
May 6, Saturday.....	Standing of Students Reported
May 30, Tuesday.....	Memorial Day, a Holiday
June 11, Sunday.....	Baccalaureate Address
June 14, Wednesday.....	Commencement
June 14-16, Wednesday-Friday.....	Examinations

SUMMER QUARTER

June 19, Monday.....	First Term Begins
July 4, Tuesday	Independence Day, a Holiday
July 28, Friday.....	First Term Ends
July 31, Monday	Second Term Begins
September 1, Friday.....	Second Term Ends

AUTUMN QUARTER

September 26-27, Tuesday-Wednesday.....	Registration Days
September 28, Thursday.....	Instruction Begins
November 11, Saturday.....	Standing of Students Reported
November 30, Thursday.....	Thanksgiving Day, a Holiday
December 20-22, Wednesday-Friday.....	Examinations and Registration
December 22, Friday, Noon.....	Quarter Ends; Christmas Recess Begins

An act of the Seventeenth Legislative Assembly provides that schools shall not be dismissed on the following days, but appropriate exercises, as a part of the day's program shall be held in each school when in session: February 12. (Lincoln's birthday), February 22, (Washington's birthday), second Tuesday of May (Arbor day), June 14 (Flag Day), October 12 (Columbus day), November 1, (Pioneer day), November 11. (Armistice day).

Official Directory

EXECUTIVE BOARD.

ALFRED ATKINSON (ex-officio), Chairman.....	Bozeman
J. H. BAKER (term expires April 1923).....	Bozeman
W. S. DAVIDSON (term expires April 1921).....	Bozeman
ALLEN CAMERON Secretary-Treasurer.....	Bozeman

ADMINISTRATIVE OFFICERS

EDWARD C. ELLIOTT, Ph. D.....	Chancellor, University of Montana
ALFRED ATKINSON, D. Sc.....	President
FREDERICK B. LINFIELD, B. S. A.,.....	Dean of Agriculture and Director, Experiment Station
FRED S. COOLEY, B. S.,.....	Director, Extension Service
JAMES M. HAMILTON, M. S.,.....	Dean of Men
UNA B. HERRICK.....	Dean of Women
EARLE B. NORRIS, M. E.....	Dean of Engineering
JOHN H. HOLST, M. A.....	Principal Secondary School and Director Summer Session
ROY ORVIS WILSON, B. S.,.....	Registrar
MIRDYALEEN MAXWELL.....	House Director at Hamilton Hall
ADELE MCCRAY	College Nurse
RAY B. BOWDEN.....	Editorial Director

THE FACULTY

Professors

ABBEE, MYRON J.....	Professor of Agricultural Education A. B., Brown University, 1902.
ARNETT, CLARE NEWTON.....	Professor of Animal Husbandry B. S. A., Purdue University, 1907.
ATKINSON, ALFRED	President B. S., Iowa State College, 1904; M. S. Cornell University, 1912; D. Sc., Iowa State College, 1920.
BALDWIN, LANA A.....	Professor of Applied Art
BREWER, WILLIAM F.....	Professor of English A. B., Grinnell College, 1891; A. M., 1897; A. M., Harvard University, 1899.
BUBB, JOHN.....	Professor of Military Science and Tactics Major U. S. Army.
CARDON, PHILIP VINCENT.....	Professor of Agronomy B. S., Utah Agricultural College, 1909.
COBLEIGH, WILLIAM M.....	Professor of Chemistry and Chemical Engineering A. M., Columbia University, 1899.

- CONKLING, LEON D.....Professor of Civil Engineering
C. E., Cornell University, 1900.
- COOLEY, ROBERT A.....Professor of Entomology and Zoology
B. S., Massachusetts Agricultural College, 1895.
- FISK, PAULINE.....Professor of Home Economics
B. S., Simmons College, 1918.
- FORREST, ELIZABETH Librarian
B. L. S., University of Illinois, 1906; A. M., University of Chicago, 1917.
- GRAVES, D. V.....Professor of Physical Education
- HAM, FRANK W.....Professor of Physics
B. S., Montana State College, 1903; M. S., 1905.
- HAMILTON, JAMES M.....Dean of Men and Professor of Economics
B. S., Union Christian College, 1887; M. S., 1890.
- HERRICK, UNA B.Dean of Women's Work and Director of
Physical Education for Women
- *HOLST, JOHN
Principal of Second Schools, Director of the Summer Session
and Assistant Professor of English
A. M., University of Montana, 1918.
- LINFIELD, FREDERICK B.....Dean of Agriculture
B. S. A., Ontario Agricultural College, 1891.
- MARTIN, GEORGE LESTER.....Professor of Dairy Husbandry
B. S., Iowa State College, 1908.
- NORRIS, EARLE B.....Dean of Engineering and Professor of
Mechanical Engineering
B. S., Pennsylvania State College, 1904; M. E., 1908.
- O'GORMAN, JAMES M.....Professor of Psychology and Education
B. S., Columbia University, 1909; A. M., 1910.
- PLEW, WILLIAM R.....Professor of Architectural Engineering
B. S., Rose Polytechnic Institute, 1907; M. S., 1910; A. E., University of
Illinois, 1920.
- SCHOPPE, WILLIAM F.....Professor of Poultry Husbandry
B. S., University of Maine, 1907; M. S., 1913.
- SWINGLE, DEANE B.....Professor of Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wis-
consin, 1901.
- TALLMAN, WILLIAM D.....Professor of Mathematics
B. S., University of Wisconsin, 1896.
- THALER, JOSEPH A.....Professor of Electrical Engineering
E. E., University of Minnesota, 1900.

*On leave of absence—Columbia University.

WELCH, HOWARD.....Professor of Veterinary Science
A. B., University of Missouri, 1902; B. S. A., 1906; D. V. M., Cornell University, 1909.

WILSON, ROY ORVIS.....Professor of Secretarial Studies and Registrar
B. S., South Dakota State College, 1911.

Assistant Professors

BREWER, HELEN R.....Assistant Professor of History
A. B., Grinnell College, 1888.

*CHALLENGER, RALPH T.....Assistant Professor of Trades and Industry
B. S., Kansas State Agricultural College, 1908; M. E., 1918.

CURRIER, EDWIN L.....Assistant Professor of Farm Management
B. S., University of Nebraska, 1912.

DONALDSON, JESSIE.....Assistant Professor of English
A. B., University of Minnesota, 1913.

FRANKS, EDITH.....Assistant Professor of Home Economics

GARRISON, EMMA PAULINE.....Assistant Professor of Home Economics
B. S., Columbia University, 1919.

GIESEKER, LEONARD F.....Assistant Professor of Agronomy
B. S., University of Nebraska, 1908; M. S., Cornell University, 1914.

GRANT, EUGENE L.....Assistant Professor of Civil Engineering
B. S., University of Wisconsin, 1917.

HOLMES, WILLIAM BARTHOLOMEW.....Assistant Professor of
Secretarial Studies
B. S., James Milliken University, 1913.

JENNISON, HARRY M.....Assistant Professor of Botany and Bacteriology
B. S., Massachusetts Agricultural College, 1908; A. M., Wabash College, 1911.

JOSEPH, WALTER EDWARD.....Assistant Professor of Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.

KIEFER, JAMES A.....Assistant Professor of Physics
B. S., Montana State College, 1914.

LUDWIG, ALFRED.....Assistant Professor of Mechanical Engineering
C. E., Rensselaer Polytechnic Institute, 1889.

MURDOCK, HARVEY E.....Assistant Professor of Farm Mechanics
B. S., University of Colorado, 1906; M. E., 1908; C. E., University of Colorado, 1911.

MCCALL, WILLIAM H.....Assistant Professor of English
A. B., Ohio Wesleyan University, 1900; A. M., 1904.

MCCORD, ROBERT C.....Assistant Professor of Animal Husbandry
A. B., Central University, 1908; B. S. A., Iowa State College, 1913.

OWEN, JUDSON.....Assistant Professor of English
A. B., Illinois Wesleyan University, 1913; A. M., University of Wisconsin, 1920.

*On leave of absence—University of California.

- QUINN, EDMOND JOHN.....Assistant Professor of Chemistry
B. S., Notre Dame University, 1911.
- SHERWOOD, REGINALD C.....Assistant Professor of Chemistry
B. S., South Dakota State College, 1914; M. S., 1916; Ph. G., 1919.
- SLOAN, ROYAL D.....Assistant Professor of Electrical Engineering
B. S., Montana State University, 1913.
- SPAULDING, MILO H.....Assistant Professor of Zoology
A. B., Leland Stanford Junior University, 1903; A. M., 1906.
- STARRING, CECIL C.....Assistant Professor of Horticulture
B. S., South Dakota State College, 1911.
- SUMNER, HARLAN R.....Assistant Professor of Agronomy
B. S. A., Kansas State Agricultural College, 1916; M. A., University of Missouri, 1917.
- THERKELSEN, ERIC
Assistant Professor of Electrical and Mechanical Engineering
B. S., University of Washington, 1911; M. S., 1913.

Instructors

- BALLARD, J. I.....Instructor in Mathematics
B. S., Michigan College of Mines, 1906; E. M., 1911.
- BULL, FRIEDA M.....Instructor in Mathematics
B. S., Montana State College, 1907; M. S., 1909.
- CURRIER, BERNICE CHAMBERS.....Instructor in Orchestra Music
- DAVIS, BEATRICE FREEMAN.....Instructor in English
B. S., Montana State College, 1900; Ph. B., University of Chicago, 1902.
- ECKLES, CARRIE B.....Instructor in Vocal Music
- GILLESPIE, SALLIE.....Instructor in Art
B. Ds., Tulane University, 1920.
- GRIFFIN, FRED L.....Instructor in Mechanical Engineering
- HARTMAN, JUNE.....Instructor in Piano Music and Acting
Head of Department of Music
B. S., Montana State College, 1910.
- HOLMSTROM, RUBY.....Instructor in Home Economics
B. S., Lake Forest College, 1910; A. M., University of Chicago, 1915.
- HOMANN, FREDERICK C.....Instructor in Mechanical Engineering
B. S., Montana State College 1916.
- HOWARD, LOUIS L.....Instructor in Band Music
- KAHAN, ROSE.....Cataloguer
A. B., University of Washington, 1908.

- KATELY, FRED W.....Instructor in Forge and Foundry
- LINDBLOM, ANNA E.....Instructor in English
A. B., Iowa State University, 1912; A. M., 1915.
- MAXWELL, LORA M.....Instructor in Physical Education
B. Pd., Montana State Normal Collage, 1911.
- MAXWELL, MIRDYALEEN.....Instructor in Institutional Management
B. S., University of Minnesota, 1914; M. S. Columbia University, 1919.
- NASH, BENETTA D.....Instructor in Piano Music
B. M., University of Oregon, 1895.
- ***SEAMANS, HOWARD L.....Instructor in Entomology and Zoology
B. S., Montana State College, 1916.
- SIBLEY, GERTRUDE M.....Instructor in English
A. B., Mount Holyoke College, 1913.
- *SMITH, LOLIE.....Instructor in Home Economics
B. S., Texas College of Industrial Arts, 1916.
- SWEAT, RUTHInstructor in Home Economics
B. S., Montana State College, 1916.
- TALLMAN, MAUDE D.....Instructor in Mathematics
B. S., Montana State College, 1907.
- TRETSVEN, OSCAR.....Instructor in Animal Husbandry
- TRUITT, ERNEST G.....Instructor in Spanish
- YOUNG, DELLA A.....Instructor in Stenography and Typewriting
Pd. M., Colorado Teachers' College, 1917; A. B., 1918.

Assistants

- **ABBOTT, MABEL I.....Assistant Librarian
A. B., University of Minnesota, 1902; Graduate New York Public Library, 1914.
- HUMPHREY, LEO C.....Assistant in Chemistry
B. S., Montana State College, 1919.
- JUMP, CECILE J.....Assistant in Art and French
- LUND, HELEN.....Assistant in Art
B. S., Montana State College, 1918.

* Resigned, November 21, 1920.

**Resigned, November 9, 1920.

***Resigned, April 1, 1921.

EXPERIMENT STATION STAFF

LINFIELD, FREDERICK B..... Director
B. S. A., Ontario Agricultural College, 1891.

Department Heads

ARNETT, CLARE NEWTON.....Animal Husbandry
B. S. A., Purdue University, 1907.

BURKE, EDMUND.....Chemistry and Meteorology
B. S., Montana State College, 1907.

CARDON, P. V.....Agronomy
B. S., Utah Agricultural College, 1909.

COOLEY, ROBERT A.....Entomology
B. S., Massachusetts Agricultural College, 1895.

CURRIER, EDWIN L.Farm Management
B. S., University of Nebraska, 1912.

MURDOCK, HARVEY E.....Agricultural Engineering
B. S., University of Colorado, 1906; M. E., 1908; C. E., 1911.

SCHOPPE, WILLIAM F.....Poultry
B. S., University of Maine, 1907; M. S., 1913.

SWINGLE, DEANE B.....Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.

WELCH, HOWARDVeterinary
A. B., University of Missouri, 1902; B. S. A., 1906; D. V. M., Cornell University, 1909.

WHITCOMB, WILLIAM O.....Superintendent of Grain Laboratory
B. S. A., North Dakota Agricultural College, 1909; M. S. A., Cornell University, 1913.

*..... Horticulture

Department Assistants

BLISH, MORRIS J.Chemistry
B. S., University of Nebraska, 1912; A. M., 1913; Ph. D., University of Minnesota, 1915.

DAY, W. FRIEND.....Grain Laboratory

GIESEKER, LEONARD F.....Agronomy
B. S., University of Nebraska, 1908; M. S. A., Cornell University, 1914.

JONES, RAY S.....Chemistry
B. S., Montana State College, 1915.

JOSEPH, W. E.....Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.

*Vacancy to be filled.

McCHORD, ROBERT C.....	Animal Husbandry
A. B., Central University, 1908; B. S. A., Iowa State College, 1913.	
MORRIS, ERNEST.....	Agronomy
MORRIS, H. E.....	Botany and Bacteriology
B. S., Montana State College, 1909; M. S., University of Wisconsin, 1917.	
NELSON, JOSEPH B.....	Agronomy
PARKER, JOHN R.....	Entomology
B. S., Massachusetts Agricultural College, 1908.	
PINCKNEY, REUBEN M.....	Chemistry
B. S., Nebraska Wesleyan University, 1906; A. M., University of Nebraska, 1908.	
PLUMB, C. W.....	Station Clerk
SEAMANS, HOWARD L.....	Entomology
B. S., Montana State College, 1916.	
SELBY, H. E.....	Farm Management
B. S., Oregon Agricultural College, 1916.	
STARRING, CECIL C.....	Horticulture
B. S., South Dakota State College, 1911.	
STEWART, MILDRED V.	Chemistry
B. S., University of Wisconsin, 1918.	
SUMNER, HARLAN R.....	Agronomy
B. S. A., Kansas State Agricultural College, 1916; A. M., University of Missouri, 1917.	
TRETSEVEN, OSCAR.....	Animal Husbandry

SUB-STATION STAFF

Judith Basin Sub-Station, Moccasin

OSENBERG, ALBERT.....	Acting Superintendent
B. S., Montana State College, 1916.	
MAY, RALPH W.	Assistant
B. S., Kansas Agricultural College, 1913.	

Northern Montana Sub-Station, Havre

MORGAN, GEORGE	Superintendent
B. S., Montana State College, 1912.	
WOODWARD, NORVAL F.....	Assistant
B. S., Washington State College, 1912.	

Huntley Sub-Station, Huntley

HANSEN, DAN	Superintendent
-------------------	----------------

SEAMANS, ARTHUR Assistant
B. S., Montana State College, 1913.

Horticultural Sub-Station, Corvallis

THORNBUR, HARVEY Superintendent
B. S., Washington State College, 1911.

AGRICULTURAL EXTENSION STAFF

COOLEY, FRED S. Director
B. S., Massachusetts Agricultural College, 1888.

BRANEGAN, GLADYS.....Home Management Specialist
M. A., Columbia University, 1920.

CAMPBELL, J. R.....State Leader Extension Schools and Meetings
B. S. A., Iowa State College, 1909; M. S., 1911.

COPELAND, A. J.Farm Management Demonstrator
B. S., Ohio State University, 1915.

GRABER, MARY ANN.....Assistant State Leader of Home
Demonstration Agents
B. S., Ohio State University, 1915.

HAMPTON, SAMUEL J. Lecturer

JENNISON, HARRY M.....Extension Botanist
B. S., Massachusetts Agricultural College, 1908; A. M., Wabash College, 1911.

LEE, BLANCH.....Assistant State Leader of Home Demonstration Work
B. S., University of Minnesota, 1918.

LINHOFF, EMILY A.....Assistant Club Leader
Stout Institute, 1915.

LOTT, ELMO HAMILTON.....Assistant State Leader of County Agents
B. S., Cornell University, 1912; B. S. A., Iowa State College, 1917.

MILLIN, RICHARD B.....Livestock Specialist
B. S., University of Illinois, 1916.

OGGARD, ARTHUR J.....Extension Agronomist
B. S., North Dakota Agricultural College, 1913.

OMAN, ARTHUR E.....Biological Field Agent
M. S., Yale University, 1906.

PATCHIN, RUTH.....Clothing Specialist
B. S., University of Minnesota, 1920.

POTTER, C. E.....State Leader of Boys' and Girls' Clubs
B. S., West Virginia University, 1919.

QUAW, MIGNON M.....Assistant State Leader of Home Demonstration
Agents
B. S., Montana State College, 1902; M. A., Columbia University, 1910.

- SMITH, R. L..... Poultry Specialist
B. S., University of Maine, 1912.
- TAYLOR, JOHN C.....Assistant Leader of County Agents
B. S., Montana State College, 1912.
- TURLEY, ANNA M.....State Leader of Home Demonstration Work
B. S., Purdue University, 1911.
- WARE, JOHN F.....Market Specialist
B. S., University of Minnesota, 1909.
- WILSON, MILBURN LINCOLN.....State Leader of County Agents
B. S. A., Iowa State College, 1907; M. S., University of Wisconsin, 1920.

County Agricultural Agents

- ANDERSON, A. D.....Chouteau County, Fort Benton
- BODLEY, RALPH E.Gallatin County, Bozeman
B. S., University of Nebraska, 1912.
- BROSSARD, H. S.....Yellowstone County, Billings
B. S., Utah Agricultural College, 1916.
- CAMPBELL, LOUIS A.....Hill County, Havre
B. S., University of Minnesota, 1916.
- CLARKSON, ROBERT E.....Teton County, Choteau
B. S., Montana State College, 1917.
- DEPUE, HAROLD F.....Richland County, Sidney
B. S., University of West Virginia, 1919.
- GORDON, W. R.....Broadwater County, Townsend
B. S. A., West Virginia University, 1916.
- GUSTAFSON, GEORGE W.....Jefferson County, Boulder
B. S. A., North Dakota Agricultural College, 1914.
- HILLMAN, FRANK M.....Sanders County, Thompson Falls
B. S., University of Minnesota, 1912.
- JONES, DAVID W. JR.....Chouteau County, Fort Benton
B. S. A., Utah Agricultural College, 1912.
- JONES, W. H.....Stillwater County, Columbus
B. S. A., West Virginia University, 1915.
- LEWIS, GROVER E.....Prairie County, Terry
B. S., Utah Agricultural College, 1916.
- MANNING, J. W.....Lewis and Clark County, Helena
B. S., Montana State College, 1917.
- MACSPADDEN, F. E.....Cascade County, Great Falls
B. S., Montana State College, 1917.
- McKEE, R. B.....Flathead County, Kalispell
B. S., North Dakota Agricultural College, 1916.

MENDENHALL, DEANE W.....	Dawson County, Glendive B. S., North Dakota Agricultural College, 1914.
PETERSON, CARL H.....	Fergus County, Lewistown
NOBLE, DANIEL B.	Roosevelt County, Poplar B. S., Montana State College, 1919.
SPAIN, MARVIN	Musselshell County, Roundup B. S., Montana State College, 1911.
SPRING, L. H.....	Ravalli County, Hamilton B. S. A., Oregon Agricultural College, 1910.
STAPLETON, W. P.	Phillips County, Malta B. S. A., North Dakota Agricultural College, 1913.
STEBBENS, MURRAY E.....	Valley County, Glasgow B. S., North Dakota Agricultural College, 1916.
THORFINNISON, M. A.....	Blaine County, Chinook B. S. A., North Dakota Agricultural College, 1917.
WAGNER, PAUL C.....	Rosebud County, Forsyth B. S. A., Iowa State College, 1916.
YERRINGTON, C. M.....	Custer County, Miles City B. S., North Dakota Agricultural College, 1914.

County Club Leaders

KAUFFMAN, H. N.....	Flathead County, Kalispell A. B. Wittenberg College, 1911.
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Home Demonstration Agents

BORTHWICK, ALBERTA.....	Cascade County, Great Falls B. S., Montana State College, 1916.
ERICKSON, GERTRUDE.....	Valley and Roosevelt Counties, Glasgow
FOSTER, INEZ.....	Yellowstone County, Billings B. S., University of Minnesota, 1915.
HOTT, NORA M.....	Fergus County, Lewistown B. S., Kansas State Agricultural College, 1914.
INGRAM, DORIS.....	Stillwater County, Columbus B. S., Montana State College, 1919.
KELLEY, JEANNETTE A.....	Flathead County, Kalispell B. S., Montana State College, 1917.
MYERS, HAZEL.....	Blaine County, Chinook B. S., Kansas Agricultural College, 1912.
SWAN, INEZ B.....	Lewis and Clark County, Helena

FACULTY COMMITTEES

ATHLETICS:

Swingle, Graves, O'Gorman

ELIGIBILITY OF ATHLETES:

Atkinson, Schoppe, Wilson.

FAIRS AND EXHIBITS:

Parker, Miss Baldwin, Joseph, Wilson, Plew.

FRATERNITIES:

Hamilton, Mrs. Herrick, Arnett, Schoppe, Miss Donaldson.

GRADUATE STUDENTS:

Cooley, Thaler, O'Gorman.

HEALTH:

Swingle, Cooley, Holmes, Miss Fisk, Mrs. Herrick.

INSTRUCTION:

Cobleigh, Miss Fisk, O'Gorman.

INTERSCHOLASTIC:

Jennison, Tallman, Wilson, Graves, Brewer, Plew.

LIBRARY:

Brewer, Joseph, Miss Garrison, Cooley, Miss Brewer.

ADVANCED STANDING:

Conkling, Swingle, Martin, Schoppe.

NEW COURSES:

Ham, Tallman, Brewer.

PUBLICATIONS:

Brewer, Wilson, Bowden.

PUBLIC EXERCISES:

Atkinson, Mrs. Herrick, —————.

REGISTRATION:

Wilson, Miss Brewer, Tallman.

SCHOLARSHIP AND STUDENT ATTENDANCE:

Conkling, Ham, Mrs. Herrick, Hamilton, Schoppe.

SERVICE:

Conkling, Wilson, Swingle.

STUDENT SOCIAL AFFAIRS:

Mrs. Herrick, Wilson, McChord, Hamilton, Spaulding.

STUDENT LOANS:

Linfield, Mrs. Herrick, Norris, Hamilton, Cameron.

University of Montana

HISTORICAL SKETCH

An Act of Congress approved February 18, 1881, dedicated for university purposes in Montana, seventy-two sections of the public domain. The Enabling Act, providing for the organization of the State of Montana and its admission to the Union, February 22, 1889, confirmed this grant to the State and added one hundred thousand acres for a school of mines, one hundred thousand acres for normal schools, and one hundred and forty thousand acres for an agricultural college.

The Third Legislative Assembly of the State of Montana, in February, 1893, enacted laws providing for the establishment of all these institutions, and locating the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon, and the State Agricultural College at Bozeman.

As the lands granted for higher educational purposes, together with timber or stone thereon, have been sold, the proceeds have gone into permanent funds invested for the various institutions, and the interest on these funds, together with the rentals of unsold lands, have been used for the support of the respective institutions. These maintenance resources have been supplemented with appropriations made each subsequent biennial by the Legislative Assembly, which has also provided for the erection of buildings at the expense of the State.

At the general election in November, 1920, the voters of the state, by a large majority, enacted, through the popular initiative, two measures for the financial support and development of the University of Montana. The first of these measures levies a tax of one and one-half mills on all the taxable property in the state annually for ten years for the maintenance of the University of Montana; the second provides for a state bond issue, from the proceeds of which three and three-quarters million dollars become available for the erection and equipment of buildings at the several institutions of the University of Montana.

These institutions were administered independently by local executive boards for some years under the general supervision of the State Board of Education; by a law of 1909 the powers of the local boards were more closely defined and the direction of the State Board of Education made more effective. By the enactment of Chapter 92 of the Laws of the Thirteenth Legislative Assembly in 1913 the four institutions were combined into the University of Montana under the executive control of an officer whose title is Chancellor. In October, 1915, the State Board of Education appointed Edward C. Elloitt, then of the University of Wisconsin as the first Chancellor of the University of Montana. He assumed his duties February 1, 1916.

College of Agriculture and Mechanic Arts

HISTORICAL SKETCH

By an Act of the Third Legislative Assembly of Montana, signed by Governor J. E. Rickards, February 16, 1893, the Agricultural College of the State of Montana was located at Bozeman. This Act provided for an Executive Board which should have the immediate control and direction of the affairs of the College, subject only to the general supervision of the State Board of Education. The Executive Board was authorized to appoint a secretary and treasurer and to choose a president and faculty.

On March 21, 1893, the State Board of Education held its first meeting at Bozeman. A site of forty acres for campus was donated by Nelson Story, Sr. An adjoining one hundred and sixty acres of land, owned by Gallatin county, was donated, one-half by the county and one-half by the citizens of Bozeman. An Executive Board was appointed. The Executive Board chose Luther Foster for Acting President. On April 17, with the president and an assistant, instruction was begun. September 15, the College opened for its first full year's work. A. M. Ryon was president and the faculty numbered six. Courses were offered in agriculture, domestic economy, and applied science, the last being chiefly engineering and chemistry. There was also established a one-year preparatory course, a two-years business course, modeled after the usual private business college, and a music department.

Nelson Story, Sr., donated the use of a frame building which had been occupied as a Presbyterian Academy. The public school board allowed the use of some rooms in a nearby school building. During the summer of 1894, the brick veneer building now used for biology was erected out of the Hatch Experiment Station Fund.

The Legislative Assembly in 1895 authorized a bond issue of \$100,000 to provide funds to erect and furnish buildings for the college.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Section 16 grants ninety thousand acres of land to Montana for the use and support of an agricultural college, according to the terms of the Act of Congress,

July 2, 1862, and Section 17 grants an additional fifty thousand for the same purpose and subject to the same conditions and limitations as the other grant. The one hundred and forty thousand acres of land cannot be sold for a price less than ten dollars per acre and the principal, together with all money received from the sale of timber, is to be invested as a permanent endowment. The unsold land may be leased, and the rental, together with the interest on the permanent endowment, shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriated twenty-five thousand dollars annually out of the treasury of the United States. By the Nelson Bill, passed March 3, 1907, this amount was increased annually by five thousand dollars each year, beginning in 1907, until now the total annual appropriation has reached fifty thousand dollars, at which figure it is to remain.

The Smith-Hughes Act of Congress, February, 1917, provides a plan for vocational education in agriculture, home economics and trades and industries. To carry out the provisions of this Act, annual appropriations are made by both federal and state governments and the teacher training in agriculture and home economics is carried on by the college.

PURPOSE AND SCOPE.

The purpose of the college of agriculture and mechanic arts is chiefly to provide collegiate education in agriculture, engineering, home economics, applied art, secretarial studies and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in the act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for

further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture and mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893, accepts these grants of land and money and provides that the Montana State College shall have for its object "instruction and education in the English language, literature and mathematics, civil and mechanical engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology and such other natural sciences as may be prescribed by the State Board of Education; political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

THE COLLEGE CAMPUS AND FARM

The college grounds and farm contain four hundred acres. Forty acres of this constitutes the college campus, buildings, recreation grounds, lawn, driveways, flower beds and shrubbery. Three hundred and sixty acres remaining are utilized for farming and experiment station purposes.

BUILDINGS

The college buildings are in groups having relation to the purposes for which they are used. The administrative offices, library, assembly room, and departments of English, mathematics, physics, history, music and applied art are all located in Montana Hall. This is a three-story brick building situated in the center of the campus.

The work in engineering is carried on in a group of buildings located just back of Montana Hall. This group provides class rooms and laboratories for architectural, electrical, civil and mechanical engineering and shops for power, machinery, machine work, wood work, iron work and foundry. The college heating plant is located with the engineering group and its facilities are available for the instruction of engineering students.

The College of Agriculture group includes the main Agricultural Building, in which are located offices, class rooms, laboratories for agronomy, horticulture, dairying, animal husbandry and agricultural education. In addition, the offices and rooms used by the Agricultural Experiment Station and the Extension Service are in this building.

Outside the main Agricultural Building, there are a Veterinary Building, Poultry Plant, modern barns for the different classes of livestock, grain storage rooms for crop study, modern greenhouses and storage facilities for horticultural products.

The work in home economics is conducted on the second floor of Agricultural Hall. Here are provided modern facilities for work in cooking, sewing and household management. The work in applied art is located on the second floor of Montana Hall.

The science departments of the college are housed in two different buildings. For the work in chemistry, a modern fire-proof building was completed in 1919. This is large enough to meet all of the requirements of students in chemistry and, since the building previously used for chemistry was destroyed by fire, all of the furniture, apparatus and equipment is new.

For entomology-zoology and botany-bacteriology, the building known as the Biology Building is used. This is a brick structure with work conducted on three floors.

Hamilton hall is the residence hall for women on the campus. This was constructed in 1911 and has facilities for sixty people.

For work in physical education and athletics, the college gymnasium, a frame structure, is used. This building is used for regular physical education classes and is especially suited for work in basketball and other indoor athletics.

New Buildings Assured.

To provide for adequate facilities to care for the rapidly growing student body, the voters of Montana at the election held November, 1920, authorized the issuance of bonds to the amount of three and three-quarter million dollars for the erection, equipment and repair of buildings at the four institutions of higher education of Montana. The Montana State College will get a substantial allotment out of this fund and this should insure the additions to the buildings which are needed to adequately care for the departments for a considerable period. The plans for new buildings are now being made and the construction is to go forward in the immediate future.

COLLEGE SURROUNDINGS

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee & St. Paul railroad. For convenience, healthfulness and beauty of surrounding the location is unsurpassed. The college is situated on an elevation which commands a view of one of the most

fertile valleys in the world, covered far and wide with grain fields, and surrounded on all sides by lofty mountains.

Bozeman is a city of homes and churches, with a wholesome moral environment. It is a most desirable residence city for families who wish to educate their children. The college is reached from the railroad station and city by an electric car line.

EXPENSES OF STUDENTS

BOARD AND ROOM FOR MEN

Since January, 1919, the barracks built by the State and Federal government for the accommodation of the Students' Army Training Corps have been used as living quarters and dining room for men students. The future policy governing the use of these buildings will depend on the demands for teaching space. If living quarters for men are to be maintained in the future announcement will be made.

Fraternity houses are maintained by students which accommodate a number for board and room. Students who do not live in the men's dormitory may find room and board in private families convenient to the college, for \$35 to \$40 per month. The total college expenses for the year, including fees, books, room, board and incidental expenses, may be estimated from \$400 to \$500. A list of approved places with prices and accommodations is kept in the registrar's office. A committee of students meets all trains on registration days and at other times on request, and aids in finding satisfactory locations.

BOARD AND ROOM FOR WOMEN

Hamilton Hall is the college home for women. The Hall is under the supervision of the house director, and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to the location and size of room. Because of the unusual fluctuation of food costs the following prices are subject to change at any time during the year:

One in single room	\$36.00
Two in single room (each)	\$34.50
Two in double room (each)	\$35.00
Two en suite (each)	\$38.00
Three en suite (each)	\$36.00

The above prices are for a calendar month. Of these amounts \$29.00 is for table board and the remainder for room rent. Application for rooms in the hall may be made at any time to the house director, and must always be accompanied by a deposit of \$5.00 to insure reservation. This amount will be returned if the house director is notified before September 26th, or will be deposited until the room is vacated. When a room is vacated if, in the judgment of the house director, the room and furniture have not been injured more than could be expected from the ordinary wear and tear, the \$5.00 shall be refunded. If either the room or the furniture has been injured more than would be due to ordinary wear and tear, such portion of the \$5.00 shall be retained by the institution as will be needed to make good the damage. All freshmen women entering the institution are required to live in Hamilton Hall for the entire college year. All other women reserving rooms in Hamilton Hall will be expected to continue residence for the entire college year unless they withdraw from the institution. Residents who leave the Hall before the close of the quarter will be required to pay the room rent till the end of the quarter. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of \$1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before registration day, and no deduction will be made for late arrivals. The Hall will not be open for occupancy until the day before registration day. No deduction is made for absence at week-ends or during vacations, except the Christmas holidays, when room rent only will be paid. The residents may have guests at meals by making arrangements for same at the house director's office the day before, and may also have the privilege of the laundry by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have same laundered; also white scrim curtains, a napkin ring and any room decorations they may fancy.

RAILROAD FARE REFUNDS

In accordance with the provisions of Chapter 123 of the Session Laws of 1917, enacted by the Fifteenth Legislative Assembly, and under regulations established by the State Board of Education, railroad fare in excess of five dollars actually paid by any student for a round trip between his Montana home and any institution of the University of Montana once each year, will be refunded.

No war tax that has been paid by any student will be refunded under any conditions whatever.

FEES AND DEPOSITS.

A fee is a fixed charge, no part of which is returnable except as specified under refunds. A deposit is intended to serve as a security against losses and breakage. Any unused balances are returnable up to thirty days after the close of the academic year. If not then withdrawn, they are forfeited.

Registration Fee	\$10.00
Payable annually in advance by each college student in attendance during the autumn, winter, or spring quarter. In no case will any part of the fee be refunded.	
Short Course Registration Fee.....	\$ 6.00
Payable annually in advance by each student in the School of Agriculture. In no case will any part of this fee be refunded.	
Registration Fee, Summer Quarter.....	\$10.00
Payable in advance by all students attending the summer quarter. In no case will any part of this fee be refunded.	
Associated Students Activity Fee.....	\$ 7.50
Payable annually in advance by all college students entering the autumn quarter. Students entering the winter or spring quarter pay \$2.50 per quarter.	
Associated Short Course Students Activity Fee.....	\$ 5.00
Payable annually in advance by each student in the School of Agriculture. Students entering the winter quarter pay \$2.50 per quarter.	
Late Registration Fee, during the first week of the Quarter.....	\$ 2.00
Payable by students registering after the prescribed registration days of any quarter, except students entering for the first time.	
Fee for Removing Conditions	\$ 2.00
Payable by students who take condition examinations at times not regularly designated in the calendar.	

Limited Registration Fee, each course, per quarter.....\$ 2.00
 Payable by special students registering for not more than two courses. The total credits for the courses shall not exceed six.

Special Attendance Fee, each course, per quarter.....\$ 2.00
 Payable by adults not regularly registered but attending classes as listeners.

Library Deposit\$ 3.00
 Payable by all students.

Hospital Fee, per quarter.....\$ 2.00
 Payable by all students.

Note—The following fees and deposits are given per quarter:

Agriculture

Number of Course	Fee	Deposit
Agronomy: 1, 11.....	1.00	\$1.00
Agronomy: 5,	1.00	.00
Animal Husbandry: a, b, c, 1, 1a, 2, 2a, 3, 6.....	1.00	.00
Animal Husbandry: e, f, i, 11.....	2.00	.00
Dairy: 1, 1a, 2.....	2.00	1.00
Dairy: a, b, c, d,	2.00	1.00
Horticulture: a, 1, 13.....	1.00	1.00
Horticulture: 4,	5.00	.00
Horticulture: 6, 12, 14, 15.....	1.00	.00
Poultry Husbandry: 46, 48,	1.00	.00
Veterinary Science: 51,	2.00	.00

Art

Art: a, b, 1, 1a, 1b, 1c, 2, 2a, 2b, 2c, 3, 3a, 4, 7, 7a, 7c, 8a, 8b, 8c, 15, 16, 18a, 18b.....	.50	.00
Art: 8, 11, 12, 13, 14.....	3.00	.00
Art: 10,	2.00	4.00
Art: 19,	1.00 to 5.00	.00

Botany and Bacteriology

Botany: a	1.00	.00
Botany: 1	4.00	2.00
Botany: 2, 4, 5.....	3.00	.00
Botany: 3	3.00	3.00
Botany: 7	4.00	2.00
Botany: 11	1.00	4.00
Bacteriology: 12, 16,	4.00	3.00
Bacteriology: 14.....	4.00	4.00

Chemistry

Number of Course	Fee	Deposit
Chemistry: 1	5.00	3.00
Chemistry: a, 2, 3, 4, 5, 8, 9, 11, 12, 14, 17, 18, 19..	4.00	4.00
Chemistry: 7	6.00	4.00
Chemistry: 23	2.00	2.00

Engineering

Civil: 1, 1a, 2, 4, 9, 28, 39	1.00	2.00
Civil: 32 .....	.00	2.00
Civil: 8, 34, 38, 44	2.00	2.00
Electrical: 4, 10, 14a	1.00	5.00
Mechaical: 2, 3, 4, 4a, 5, 9, 21, 27	2.00	2.00
Mechanical: 15, 15a, 20, 22a, 28, 32	2.00	.00
Engineering Drawing: 4	1.00	1.00

Entomology and Zoology

Zoology: 1, 2, 3, 15, 17	3.00	.00
Entomology, 4, 5, 6, 7, 16	2.00	.00
Entomology: 8	3.00	.00
Entomology: 10	2.00 to 10.00	.00

Home Economics

Home Economics: 1a, 1b, 1c	2.50	.00
Home Economics, 12, 14, 16, 18	1.00	.00
Home Economics: 11a, 28	1.50	.00
Home Economics: 11, 13, 17, 17a, 20	2.00	.00
Home Economics: 7 .....	.50	.00
Home Economics: 2,	3.00	.00
Home Economics, 4, 6, 23	4.00	.00
Home Economics: 1000	.50 to 6.00

Mineralogy

Geology: 2,	4.00	4.00
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Physics

Physics: a, c, 1a, 2, 4, 5, 9, 14, 16	1.00	1.00
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Secretarial

Secretarial: 3, 4	1.00	.00
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Music

	Fees
Piano, one half-hour lesson per week.....	\$15.00 to \$18.00
Piano, two half-hour lessons per week	27.00 to 33.00
Piano, ensemble playing	7.00
Voice, one half hour lesson per week	18.00
Voice, two half hour lessons per week.....	33.00
Piano, rent one hour per day	4.00
Piano rent, each additional hour per day	3.00

Dormitory Room and Board

Women's Dormitory Room and Board, a month.....	\$35.00 to \$38.00
Depending on room.	

REFUND OF FEES**Registration Fees:**

Registration fees, (including summer quarter registration, late registration, limited registration, and special attendance fees), will not be refunded under any circumstances.

Associated Students Activity Fees:

Students who have entered the autumn quarter and paid the annual associated student activity fee will receive a refund of one half the amount paid if they leave at or before the close of the autumn quarter. There will be no refund on account of withdrawals after the opening of the winter quarter.

Music Fees:

When music students withdraw before the end of the quarter, \$1.50 will be retained for each lesson period up to the time of withdrawal, and any balance remaining will be refunded.

No piano rentals will be refunded.

Laboratory Fees:

Students withdrawing by the beginning of the second week of any quarter will receive a refund of 90% of the laboratory fees paid for the quarter. Those withdrawing by the beginning of the seventh week will receive a refund of 40% of the laboratory fees paid for the quarter.

REQUIREMENTS FOR ADMISSION

Applicants for admission must be at least sixteen years of age and must present evidence of good moral character.

The completion of a high school or preparatory course of four years is the standard for regular entrance. This must include at least fifteen units of work. A unit is the amount of work represented by the successful completion of one subject pursued for a school year of not less than thirty-six weeks, with five recitations per week, each recitation period being not less than forty-five minutes net. Two periods of laboratory, shop or drawing work count as one recitation. The required units must include three units in English composition and literature and one in American history and government. Students are advised to include also two units in mathematics and one in science.

Candidates for admission to the school of agriculture must have completed the eighth grade in the public schools or its equivalent.

ADMISSION ON CERTIFICATES.

Graduates of any Montana high school or academy fully accredited by the State Board of Education, or of any high school or academy in another state accredited by the North Central Association, are admitted to regular standing by the presentation of an official certificate of graduation. Blanks for such certification are furnished by the registrar. They should be secured from him, filled out, and filed in the registrar's office on or before the first day of registration.

Graduates of any other secondary schools outside of Montana are admitted on the presentation of an official certificate of graduation, if the schools maintain, on the basis of regular inspection, accredited relationship with the state university or other university within the state included in the membership of the Association of American Universities.

ADMISSION ON EXAMINATION

Any other person must, in order to be admitted to regular standing, pass a satisfactory examination on not less than fifteen units* of secondary school work; provided, that any graduate of a Montana high school accredited by the State Board of Education for the

* These fifteen units must include three units of English composition and literature and one unit of American history and government. No less than one full unit in any subject will be accepted, and a student offering foreign language as part of his preparation must present at least two units in one language.

work of only one, two, or three years, may receive entrance credits without examination upon such work as has been successfully completed in such accredited courses, as shown by official certificates.

Those who expect to take entrance examinations should notify the registrar in advance, stating what subjects they desire to offer by examination. For the academic year of 1921-'22 the examination days are September 26 and 27, and for the winter and spring quarters by special arrangement.

CONDITIONAL ADMISSION

The entrance requirement of graduation from a four years accredited high school course, including at least fifteen units of credit, may be modified in individual cases by permitting the conditional admission of a student if he has at least fifteen entrance units and has been in regular attendance in a fully accredited high school for four years. To acquire regular standing such a student must present a total of fifteen entrance units. He must make up the number lacking within one year from the date of his first registration.

ADMISSION OF SPECIAL STUDENTS

Students twenty-one years of age or over, not candidates for degrees, may be admitted without the usual entrance units, as special students, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired. Special students may acquire status as regular students upon complying with the rules applicable to such cases.

ADMISSION BY TRANSFER FROM OTHER COLLEGES AND UNIVERSITIES

Students from other colleges and universities of recognized standing will be admitted without condition on presentation of certificates from such college or university that they have completed the required fifteen entrance units and have an honorable dismissal.

Credit will be given for work of collegiate grade done in other institutions of approved standing. Graduates of an approved two years normal course requiring fifteen units for entrance will be admitted to junior standing. Graduates of the Montana State Normal College who have earned credits after the completion of the two years course will be given hour-for-hour credit in subjects of university or college character up to a maximum of forty-five credits.

A student suspended or dropped at one of the other institutions of the University of Montana will not be admitted without the approval of the president of the institution by which he was suspended or dropped.

REQUIREMENTS FOR GRADUATION

Bachelor's Degree—Candidates for the bachelor's degree must complete satisfactorily one of the college courses. Students who are relieved for any reason of the requirements in military science or physical education shall present six additional credits in some other subjects.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course. In calculating points A grades count three times as many points as credits allowed for the subject, B grades twice as many points, C grades count the same number of points as credits, and D grades count nothing toward graduation.

All students who are candidates for the bachelor's degree must have completed all the required subjects listed in the course and a minimum of 204 credits.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors."

For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a quarter of recitation or lecture work, two or two and one-half hours a week for a quarter of laboratory, shop, library work, or drawing, shall count as one credit.

Attention is called to the fact that on October 1, 1917, the definition of the term credit was changed, by the transfer to the quarterly instead of the semester calendar. The new credit in time value counts just two-thirds as much as the old. Students who received credit on the books prior to October 1, 1917, in computing their standing by the present system should add fifty per cent to the number of credits and points.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one quarter, work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

ADVANCED DEGREES

Master's Degree—The Master of Science degree is conferred in the following departments: Botany and bacteriology, chemistry, entomology and zoology. To become a candidate the student must hold a bachelor's degree from the University of Montana or from

another institution of equal rank approved by the committee on graduate studies of the State College of Agriculture and Mechanic Arts. The candidate will be required to meet the following conditions:

1. The candidate shall name the particular branch of science in which he hopes to receive the degree and present evidence of sufficient preparation in this branch.

2. One full year or three-quarters of residence study amounting to at least forty-five credits of work is required.

3. There shall be a major subject and one or two minor subjects and at least one-half of the work must be done in the major subjects.

4. The major work shall be in advance of all undergraduate courses of the college but the minor subjects may be selected from among courses pursued for the bachelor's degree. The minor subjects shall be approved in advance by the committee on graduate studies.

5. The head of the department in which the major work is selected shall be the candidate's class adviser.

6. With the aid of the adviser, the candidate shall prepare and submit in writing to the committee on graduate studies, not later than the second week of his resident study, a program of the work which he intends to do as a candidate for this degree. The committee will thereupon report to the candidate and the faculty its action on the candidacy.

7. The candidate shall present a thesis, which shall be a part of his major work.

8. The candidate will offer himself for examination in his major and minor studies. This examination will be under the supervision of the committee on graduate studies and may be oral or in writing. This committee will appoint a special examining committee.

Graduate students are required to pay the regular matriculation fee and all course fees. They will not, however, be expected to pay the student activity fee.

Engineering Degrees—The professional engineering degrees, Architectural Engineer, Chemical Engineer, Civil Engineer, Electrical Engineer, and Mechanical Engineer will be conferred on graduates who present satisfactory evidence of professional work of superior quality extending over a period of not less than three years in the same branch of engineering as that in which the advanced

degree is desired. Candidates for these degrees will be required to meet the following conditions:

1. The candidate shall submit a record of his professional experience and the subject of his thesis to the committee on graduate studies for their approval not later than January first preceding commencement.
 2. The candidate shall present a bachelor's degree in engineering from an institution of recognized standing.
 3. The candidate shall present a satisfactory thesis.
 4. The candidate shall offer himself for examination before a committee of the faculty, which shall be appointed by the committee on graduate studies.
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REGISTRATION

Time for Registration—The time set for registration of students is the first two days of the autumn quarter and the first day of each of winter and spring quarters. The class room work begins the first day following registration day. Students will not be registered on days not listed for registration, except at the convenience of class advisers between four and five in the afternoon. Those who fail to present themselves for registration on the days designated for registration in any quarter, will be permitted to register later in the first week, only upon the payment of a special fee of \$2.00 in addition to the regular fees.

Change of Registration—A student desiring to change his studies will present his request to his class adviser, who, after consulting all teachers interested, will take such action as he may deem best. A change in course of study is allowed only on the approval of the student's class adviser and the registration committee.

Registration by Mail—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening enclosing their credentials to the registrar of the college and should state the work which they wish to take. These documents will be examined and the student's classification will ordinarily be determined before his arrival so that much time in registration may be saved. Those who have already been enrolled in the institution should send a letter to their class adviser several days in advance of the registration days stating clearly the work which they

plan to take and in case of elective subjects stating briefly the reasons for their choice.

If these steps are taken by students registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail as specified above should study carefully the entrance requirements for the courses in which they are interested and the prerequisites to the various subjects which they wish to take.

SCHOLARSHIP AND ATTENDANCE

Government—The college requires all students to conform to the usual standards of society and law-abiding citizenship and to manifest a serious purpose by maintaining satisfactory standing in the courses which they undertake. No student will be permitted to continue his connection with the university who shows persistent unwillingness or inability to comply with these requirements.

Leave of Absence—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

Honorable Dismissal—Students intending to sever their connection with the institution, either indefinitely or permanently, should report as soon as possible to the president either in person or writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of a quarter), will not be readmitted to the college at any later time, nor will any report of grades in credit for work done here be sent out until satisfactory explanation is made.

Passing Grades—Passing grades are marked A, B, C, or D. An average standing from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures—Work not of a passing grade shall be marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade shall be marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions shall be held on the days desig-

nated in the college calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Scholarship—The names of students making grades of D, E, and F are reported to the registrar's office at intervals approximately six weeks apart, as indicated in the college calendar. Names of delinquent students are then reported to the scholarship committee, who immediately advise these students of their delinquencies. It is the sense of the faculty that students not passing in ten credits are wasting their time and the students and their parents are notified by the scholarship committee that if the students are not passing in ten credits at the next report on the standing of students they are to be recommended to the faculty for dismissal. The report on regular quarterly examinations is considered the same as any other report on standings, and students who fail at the end of any quarter to pass in ten credits must be passing at the time of the first report in the following quarter.

The names of delinquent students are sent to the chancellor, president, registrar, and class advisers concerned.

A student placed on probation by the scholarship committee shall lose all rights and privileges of membership in all student organizations and activities. This rule shall not apply to membership in a fraternity or sorority where the student placed on probation is a duly initiated members of such fraternity or sorority.

A student on probation shall not be absent from scheduled college exercises unless ill and attended by a regular physician or the college nurse.

No leave of absence shall be granted a student on probation except upon a written request from the parent or guardian.

Absences—Students absent from required exercises are reported at the close of each day to the registrar's office. On each Monday morning, there are posted on bulletin boards, the names of those students who are to appear before the absence committee. The committee, or one of its number, may be found each Monday afternoon at four o'clock in the office of the registrar, and deals with the cases of students whose names have been listed for consideration. In the case of frequent unwarranted absences, the committee shall bring the case before the faculty for discipline. These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors will not be reported until

the instructor feels that members of these classes are wilfully remaining away from class and so wasting their time, and then these are to be reported to the absence committee for consideration and to the faculty for discipline. The instructors deal with tardiness in such manner as they deem best.

Assembly—Students are required to attend the assemblies held on each Friday during the college year, and all special assemblies. The programs of these assemblies consist of addresses, music recitals, illustrated lectures, etc.

MISCELLANEOUS INFORMATION

EMPLOYMENT AND AID FOR STUDENTS

An number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficiently money to pay their expenses for one quarter unless they have engaged work in advance. The college cannot guarantee employment but those who are willing to give efficient, faithful service have usually found work.

A few students are employed as janitors and assistants in the shops, laboratories and barns. Others care for furnaces, work in stores and at various kinds of house work. Calls for young women students to work for their board and room are numerous.

Students readily find employment at profitable wages during the summer vacation.

Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

RESERVE OFFICERS' TRAINING CORPS

The State College has been designated by the war department as one of the institutions for higher education where provision will be made for the maintenance of a Reserve Officers' Training Corps. The course outlined for this corps is entirely different from that of the S. A. T. C. It is practically the plan for military instruction which was in effect before the war. It includes a course in military drill and one in military science; it is required of freshmen and sophomores and is elective with juniors and seniors. Those who carry this course for four years are accepted as second lieutenants in the United States army for six months; if, at the end of that period, they elect to remain permanently in the army, they will

receive commissions. Certain allowances for maintenance are made to juniors and seniors; freshmen and sophomores are supplied with uniforms. The time required for this course is three hours a week.

STUDENT ORGANIZATIONS

YOUNG WOMEN'S CHRISTIAN ASSOCIATION

The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this end it conducts devotional meetings, Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work has been standardized and is supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. sends delegates to the Northwest Conference and keeps in touch with the state, national and international associations.

DEBATING

The management of the work in inter-class and intercollegiate debating, in extemporaneous speaking, and in oratory, is now vested in the manager appointed by the Associated Students, and the Pi Kappa Delta, which works in co-operation with the department of English. There is an established debate each year between the freshmen and sophomore classes. There are state contests in oratory and extemporaneous addresses and several intercollegiate debates.

THE EXPONENT

The students of the college maintain a weekly paper, The Exponent. The paper is well supported by the students and advertisers and is one of the most important student enterprises. It affords the members of the staff very valuable literary training.

ATHLETIC COUNCIL

This organization, composed of representatives from the faculty, alumni association and student body, has general control over all branches of athletics. Football, basketball, baseball, track and tennis are at present recognized.

BRANCH OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

A branch of this society is maintained at the college. Regular monthly meetings are held at which original papers are read or those

of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however, an Electrical club, which includes all the members of the Institute and all other students in the electrical engineering course.

BRANCH OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

The mechanical engineering students have a student engineering society affiliated with the American Society of Mechanical Engineers. Monthly meetings are held at which technical papers are presented by student members or by prominent mechanical engineers. All mechanical engineering students are eligible to membership.

THE CIVIL ENGINEERING SOCIETY

The students of the department of civil engineering organized this society for the purpose of promoting their interests in matters of practical importance to engineering students and the alumni. Prominent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field.

COLLEGE BAND

The college band is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments. One-half credit per quarter is allowed for those who register in band.

GLEE CLUB

Men are admitted upon examination as to musical qualifications and the membership is limited to about sixteen. Instruction and music are furnished free by the music department. Both popular and high class works are studied. One-half credit per quarter is allowed those who register in glee club.

TREBLE CLEF CLUB

This club for young women corresponds in scope and work to the men's glee club. Membership is limited to about twenty. This

club is also under the direction of the music department. Both Glee and Treble Clef clubs appear at college functions and recitals during the year. One-half credit per quarter is allowed those who register in this club.

CHORAL CLUB

Student singers of both sexes are admitted without formal examination. The Choral club was recently organized to foster more general interest in part singing. The material used ranges from college songs to high class part songs. With growth in membership larger choral works will be studied. The club has appeared on public programs with other musical organizations.

ORCHESTRA

Opportunity is given students who play any orchestral instrument to become members of the college orchestra, which contributes well selected numbers to public programs and plays an important part in assembly music and college "sings." One-half credit per quarter is allowed.

AGRICULTURAL SOCIETY

All agricultural students are eligible to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life.

HOME ECONOMICS CLUB

This club is composed of women students who are working for a degree in home economics. Meetings are held for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni in this department.

THE CHEMICAL SOCIETY

The students taking the chemical course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in the regular class work. Regular meetings are held and abstracts of recent journal articles are presented.

THE ALUMNAE CLUB

The active members of this organization are women graduates,

residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

INTERFRATERNITY COUNCIL

An organization of women and men members of Greek letter fraternities. Its purpose is to stimulate effort in student activities, to advance the interests of the college, and to promote unity among the fraternal organizations for their individual and collective welfare, guidance and protection.

ASSOCIATED STUDENTS

An organization consisting of the whole body of students of the institution. The society is organized to manage all matters of general interest to students, as athletics, debates, oratory, and entertainments.

FRATERNITIES, SORORITIES, AND SOCIAL CLUBS

There are two fraternities, which are as yet, only local organizations, the Omega Beta, with a house on South Willson Avenue, and the Beta Epsilon, which maintains a house on South Grand Avenue. The Sigma Chi, a national fraternity, has a chapter and maintains a house on South Third Avenue, and the Sigma Alpha Epsilon fraternity has a house on South Black Avenue. There is a senior honorary society known as the Septemviri. There is an honorary chemical fraternity known as the Alpha Pi, and an honorary agricultural fraternity known as the Zeta Pi. There is a national honorary forensic fraternity, the Pi Kappa Delta. There is also a club for men known as Les Bouffons, and an organization of men known as The Fangs. There are three national sororities, the Alpha Omicron Pi, with a house on South Sixth Avenue; the Chi Omega, with a house on West Olive, and the Phi Upsilon Omicron; three local sororities, the Phi Gamma, which has a house on South Grand Avenue; the Iota Delta, with a house on South Black Avenue, and the Zeta Kappa, with a house on South Tracy. There is a senior honorary society known as the Cap and Gown, and a women's literary club known as the Alpha Epsilon Theta. Fraternities, sororities and social clubs, like other student organizations, are under the supervision of the faculty.

SCHOLARSHIPS AND PRIZES

HIGH SCHOOL HONOR SCHOLARSHIPS

In order to promote the attendance of students of ability and promise upon the several institutions of the University of Montana it is the declared policy of the State Board of Education to provide for the awarding of scholarships to be known as the High School Honor Scholarships to graduates of the accredited high schools of the state.

The principal of each fully accredited high school in the state may nominate from each year's graduating class from one to four members, depending upon the size of the class (but not more than two for any one institution,) to be the recipients of high school honor scholarships. The scholarships exempt the holders from the payment of the customary fees in any of the institutions of the University of Montana. Blanks for nomination of scholars, with detailed statement of conditions, are furnished to the principals.

AGRICULTURAL CLUB SCHOLARSHIPS

Upon notice from the State Leader of Boys' and Girls' Agricultural Clubs of the awards of the annual club contests, the Chancellor will authorize the issuance of Agricultural Club Scholarships to the winners of first place in any agricultural club contest in any county in Montana, and to winners of first, second, and third places in the state agricultural club contests. These scholarships exempt the holders from the payment of the customary fees in any of the institutions of the University of Montana.

MILITARY SERVICE SCHOLARSHIPS

Upon the proper certification of the president that a student has rendered military or naval service to the nation and has been honorably discharged, the Chancellor of the University of Montana will authorize the award of a Military Scholarship to such student. The holder of such scholarship, throughout his course, will be exempt from the payment of all regular fees, but not laboratory deposits or special course tuitions.

By special action of the State Board of Education the privileges of the Military Service Scholarships are extended to all students of the University of Montana who met the requirements for membership in the Students' Army Training Corps and actually took up work in one of the corps of the University of Montana, but were de-

prived of induction through the action of the war department cancelling all inductions which were not complete November 11, 1918.

Y. W. C. A. SCHOLARSHIP

Every four years the Y. W. C. A. offers a scholarship to a woman high school graduate who might otherwise be unable to attend college. Selection of a woman is made from among the applicants on the basis of character and scholarship. The woman elected is given her fees, books, and student activity ticket, and a good home is found where she may work for her room and board.

THE MONTANA FEDERATION OF WOMEN'S CLUBS SCHOLARSHIPS

Upon the nomination of the officers of the Montana Federation of Women's clubs, the State Board of Education has authorized the award of one scholarship each year in each of the institutions of the University. The holder of such scholarship is exempted from the payment of all customary fees except the student activity fees and the special tuition fees in music. They are expected to make the required course deposits.

The Federation of Women's Clubs has arranged to assume the payment of certain of the expenses of the girls to whom these scholarships are awarded for the first year of college and to grant certain loans for the remaining three years to cover the expenses. The administration of these funds and loans is in the hands of a committee set up by the State Federation of Women's Clubs.

ARMSTRONG PRIZE IN DECLAMATION

Hon. F. K. Armstrong of Bozeman gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary schools. There is also a second prize of five dollars. Only regular students are eligible.

STORY PRIZE IN EXTEMPORANEOUS SPEAKING

Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an extemporaneous speaking contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

STUDENT LOAN FUND

GENERAL UNIVERSITY STUDENT LOAN FUND

The Montana Bankers' Association, and the Alumni of the University of Nebraska residing in Montana, have each established funds which are available for students in the junior and senior classes of any of the institutions of the University of Montana, who are unable to continue their studies without financial aid, and are satisfactorily recommended as to character and scholarship by the dean or director, or the head of the department in which the applicant's major work is done. The loan to any one student is limited to two hundred dollars during his course, and not more than one hundred dollars in any one year. Loans must be repaid within one year from the time of borrowing, or in exceptional cases, one year after graduation. Loans bear two per cent interest.

Application blanks and a statement of detailed regulations governing these loans may be obtained from the registrar.

STATE COLLEGE ALUMNI FUND

The Montana State College Alumni Loan Fund is for the purpose of assisting worthy students and alumni who are in need of funds. Loans may be made to students of collegiate rank and alumni who have not been out of college more than two years.

Borrowers are required usually to bring letters of recommendation from two to three members of the faculty and to sign a promissory note. The notes bear 4 per cent interest during the life of the instrument and 6 per cent thereafter.

The Loan Fund Manager is usually a member of the staff of the Montana State College and has his office either on or near the campus.

BASKETBALL TOURNAMENT, SPEAKING CONTEST, AND ESSAY CONTEST

The annual high school basketball tournament, speaking contest and essay contest are held on Wednesday, Thursday, Friday and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basketball teams, which have, during the basketball season, proven their superiority in competition with other teams. Appropriate school trophies are presented to the best teams, and suit-

able individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest, and an essay contest are held.

LIBRARY AND READING ROOMS

MAIN LIBRARY

The library occupies the south half of the first floor of Montana Hall. It contains 19,305 volumes not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works in technology, history, science, and literature, as well as with dictionaries, cyclopedias and other reference works.

By an Act of Congress the library is a depository and receives all public documents and other printed matter issued by the United States government.

DEPARTMENT LIBRARIES

The agricultural library occupies two rooms on the first floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One room on the first floor of the biology building is used for the library and periodicals of the biological department. A library and reading room is maintained by the College of Engineering.

Experiment Station

Associated with the State College is the Montana Agricultural Experiment Station. This Station was established by an Act of Congress, (Hatch Act), passed in 1887, and supplemented by another act, (Adams Act), passed in 1906.

In the words of these Congressional Acts, the purpose of these appropriations is as follows:

"It shall be the object and duty of said Experiment Stations to conduct original researches and verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under the varying series of crops; the capacity of new plants of trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative effect on crops of different kinds; the adoption and value of grasses and forage crops; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories."

These acts define and limit the work of the Agricultural Experiment Station. It must be directed towards the solving of the practical agricultural problems of the state and making that industry more profitable to those engaged in it.

The appropriations from the federal government have been supplemented by state appropriations.

The work covered by the Experiment Station is indicated by the ten departments of work, which are as follows:

Agronomy, Animal Husbandry, Poultry, Horticulture, Farm Management, Agricultural Engineering, Chemistry, Entomology, Botany and Bacteriology, and Veterinary.

The Experiment Station farm consists of about 260 acres of irrigated land adjoining the campus, and the Fort Ellis farm of

about 600 acres of non-irrigated land, some four miles out. Well equipped laboratories are also provided for the various departments, while all the farm buildings are arranged so as to facilitate the experiments with livestock. The equipment and facilities of the Experiment Station are available to a limited number of students for graduate work.

The great variations in the climate of the state makes necessary the establishment of substations to study the crop possibilities of various sections of the state. At present four such stations are in operation, viz: In the Judith Basin, near Moccasin; in the Yellowstone Valley near Huntley; in Northern Montana near Havre, and in the Bitter Root Valley near Corvallis. The last substation is for the study of fruit and garden crops only. While not covering all the climatic regions of the state these substations afford opportunity for more complete study of the state's agricultural possibilities and particularly of the crops adapted to particular sections of the state.

The results of the studies and observations made by the station staffs are published in bulletins, circulars, leaflets, posters, etc. They are distributed free of cost to the people of the state who apply for them. Those who would like to receive the publications as issued may have their names placed on the permanent mailing list and receive the bulletins as soon as issued. Write to the Agricultural Experiment Station, Bozeman, Montana.

Agricultural Extension Service

The co-operative extension work in agriculture and home economics had its official beginning in the passage by Congress of the Smith-Lever Act of May 8, 1914.

It has been organized as the last of the three principal divisions of the State College. All federal and state extension service in Montana in agriculture and home economics has been placed in charge of an extension director.

The field work is grouped into two classes according to the area covered as the state and county service. The projects now under way are:

1. Agronomy.
2. Boys' and Girls' club work.
3. County Agent work.
4. Extension Schools.
5. Dairy.
6. Farmers' Institutes.
7. Farm Management Demonstration.
8. Home Economics.
9. Livestock.
10. Marketing.

Agronomy consists of instruction and demonstrations in field crops, crop rotation, seeds, and soil management.

Boys' and Girls' Club work consists of clubs for corn growing, potato growing, gardening, pig, calf, colt and lamb raising, canning, bread, and garment making.

County agents are in several counties, carrying on local projects in crop demonstration, community meetings and organization, livestock, dairy, better seed, rodent and insect control, and such incidental problems in farming and country life as may arise.

Extension schools in agriculture and home economics are held in farming communities by special arrangement, three to five instructors being provided by the extension service, classes continuing for three to six days.

The dairy work has to do with better cows, and better breeding

sires, cow-test associations, silos and forage crops, feeding, shelter, and co-operative dairying.

Farmers' institutes have been held to the number of from one hundred to several hundred each year for about twenty years in Montana. The plan is to hold one and two-day meetings, in the agricultural centers of each county, each year, with lecturers distinguished as successful, practical farmers or as agricultural scientists, at each meeting.

Farm management demonstrations seek to increase good economic farm practices, and eliminate the uneconomic, by keeping farm accounts and records. These are summarized, analyzed and studied. The farmer with this knowledge is able to expand his operations in the right direction.

Home economics demonstrations in a number of counties conducted by trained women seek to improve home conditions, health, and satisfaction in country living .

The livestock project aims at the improvement of livestock, a reduction of stock losses, and a better distribution of farm animals.

The marketing activities keep farmers better informed regarding markets for farm products, promote direct dealing between producer and consumer, and stimulate the production by securing better markets and more profitable sales of farm products.

Organization for Instruction

A. The following four-years college courses, leading to the degree of Bachelor of Science, are offered:

1.—COLLEGE OF AGRICULTURE.

- (a) Agricultural Education.
- (b) Agronomy.
- (c) Animal Husbandry.
- (d) Dairy Husbandry.
- (e) Horticulture.
- (f) General Agriculture.

2.—COLLEGE OF ENGINEERING.

- (a) Architectural Engineering.
- (b) Chemical Engineering and Industrial Chemistry.
- (c) Civil Engineering.
- (d) Electrical Engineering.
- (e) Mechanical Engineering.

3.—COLLEGE OF APPLIED SCIENCE.

- (a) Applied Science.
- (b) Bio-Chemistry.
- (c) Botany and Bacteriology.
- (d) Entomology and Zoology.

4.—COLLEGE OF HOUSEHOLD AND INDUSTRIAL ARTS.

- (a) Applied Art.
- (b) Home Economics.
- (c) Home Economics Vocational Training.
- (d) Secretarial Work.

B. The following courses, not leading to a Bachelor's Degree are offered:

- (a) School of Agriculture.
- (b) Secretarial Work.

College of Agriculture

Agriculture is one of the basic industries of Montana. The establishment of successful systems of agriculture depends on a thorough understanding of the requirements of Montana's soil and climate, the kinds of crops available, the methods of culture essential to profitable crop production, the types of livestock best suited to the varied conditions which obtain, the methods of feeding and handling this livestock, and finally, the principles of farm management and the economic disposal of farm products.

It is of the utmost importance that actual farm experience constitute the foundation of every man's knowledge of agriculture, whatever the phase in which he might have a special interest. The attainment of a thorough knowledge of modern agriculture, without instruction in the underlying sciences, is slow and expensive, if not quite impossible. Recognition of this fact led to the establishment of the State College of Agriculture where students are now afforded opportunity to acquire a knowledge of the broad principles upon which agriculture is based.

The four years curriculum in agriculture leads to the degree of Bachelor of Science in Agriculture. The special course in agriculture, open only to persons who already have a degree of A. B. or B. S. from a recognized college or university, and who wish to teach vocational agriculture in high schools, also leads to the degree.

While the four years course in agriculture is designed primarily to train students who expect to engage in farming, the training offered fits young men to take up work along a number of additional lines. The general course is a good preparation for county agent work and, by a careful choice of electives, it is possible to train for special work along the lines of agronomy, animal husbandry, dairying, horticulture, agricultural education, and general agriculture.

Attention is especially directed to the demand which exists for young men trained to teach agriculture in high schools. This work has developed rapidly during the past few years and there is need for many young men to go into the field. Those who desire to prepare as high school teachers should take the electives offered by the department of general education and agricultural education, in order that they may meet the certificate requirements for high school teachers certification.

COURSE IN AGRICULTURE

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b).....	3	3	3
General Chemistry (Chem. 1).....	4	4	4
Trigonometry and Logarithms (Math: 8) or Elementary Analysis (Math. 16)			4
Livestock Judging (An. Husb. 1, 1a).....	3	3	
Poultry Management (Poult, 41).....	4		
History of Agriculture (Agron. 12)	2		
General Botany (Bot. 1)		5	
Principles of Plant Production (Hort. 1).....		3	
Farm Shop (Agron. 32)			3
Vegetable Gardening (Hort. 12)			3
Military Science (Mil. Sci. 1).....	1	1	1
*Farm Practice			
College Education (Ed. 10)	0		

*Every student, on entering, must register for farm practice; and before a degree is conferred he must furnish evidence of having had at least six months of actual farm experience.

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b).....	2	2	2
Agricultural Chemistry (Chem. 7)		5	
General Zoology (Zool. 1)	4		
Field Crops (Agron. 1)	3	4	
Forage Crops (Agron. 11)			4
Farm Dairy (Dairy 1, 1a)	3	3	
Economic Entomology (Ent. 4)			3
Agricultural Physics (Physics 1a)			5
Breeds of Livestock (An. Husb. 2, 2a)		4	4
Principles of Feeding (An. Husb. 14)	2		
Farm Structures (Agron. 26)	3		
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3		
Fruit Growing (Hort. 13)		3	
Veterinary Physiology and Anatomy (Vet. Sci. 51)		4	
Bacteriology (Bact. 16)	4		
Common Diseases (Vet. Sci. 57)			5
Principles of Soil Management (Agron. 21)	3	3	
Co-operation and Extension Methods (Agri. Ed. 4)		3	
Organic Evolution (Zool. 9)			4
Farm Management (Agron. 23)			3
Electives	8	5	6

SENIOR YEAR

Agricultural Economics (Econ. 6)		3	
Field Crop Improvement (Agron. 17)	3		
Dry Farming (Agron. 16)	3		
Farm Machinery (Agron. 30)			
or Farm Motors (Agron. 31).....		3	
Use of Irrigation Water (Agron. 28)	3		
Sanitary Science (Vet. Sci. 56)			3
Breeding Farm Animals (An. Husb. 6)			3
Beef Cattle and Sheep Production (An. Husb. 7).....		4	
Swine and Horse Production (An. Husb. 8)			2
Dairy Production (An. Husb. 12)			3
Electives	9	8	7

Those who expect to engage in practical agricultural work or enter some other field where a more general course is best adapted may choose electives from several departments.

Students may specialize in their junior and senior years in agricultural education, agronomy, animal husbandry, dairy husbandry or horticulture; it is also possible for those particularly interested in the sciences to select electives from the departments of chemistry, entomology and zoology or botany and bacteriology.

Students majoring in any one department will classify for the junior and senior years with the head of the department in which the work is selected; those selecting a general line of electives from the several departments in agricultural work and those selecting electives in the sciences will classify with the dean of agriculture.

JUNIOR YEAR ELECTIVES

Agronomy

	Autumn	Winter	Spring
Management Special Soil Types (Agron. 22)	3		
Grain Marketing and Judging (Agron. 5)	3		
Principles of Agronomic Experimentation (Agron. 18)			1
Drainage (Agron. 15)			3
Irrigation Water Supply (Agron. 27)		3	
Farm Organization (Agron. 24)			3

Animal Husbandry

Advanced Stock Judging (A. H. 3)	2		
Nutrition of Farm Animals (A. H. 4)		4	
Handling and Fitting Livestock (An. Husb. 11)			2

Agricultural Education and Education

Administration of Vocational Education (Agr. Ed. 3)		3	
Psychology (Ed. 1)	3		
Development of Vocational Education (Ed. 3)			3
Theory and Practice of Teaching (Ed. 5)			3
Forging (M. E. 9)		2	

Dairy

Inspection of Milk Products (Dairy 2)	3		
Market Milk (Dairy 5)			4
Creamery Butter Making (Dairy 3)		3	

Horticulture

Systematic Pomology (Hort 4)	5		
Commercial Vegetable Growing (Hort. 11)		5	
Trees, Shrubs and Flowers on Farm (Hort. 14)	2		

Poultry Husbandry

Poultry Breeds (Poul. 42)	3		
Incubation and Brooding (Poul. 43)		3	2

Chemistry

Agricultural Organic Chemistry (Chem. 5)	6		
Physiological Chemistry (Chem. 11)		5	
Qualitative Analysis (Chem. 2)	5		
Quantitative Analysis (Chem. 3)		5	5

Entomology and Zoology

Advanced Economic Entomology (Ento. 6)			4
Vertebrate Zoology (Zool. 2)			5

Botany and Bacteriology

Plant Physiology (Bot. 3)			6
Plant Pathology (Bot. 4)		6	

SENIOR YEAR ELECTIVES

Agronomy

	Autumn	Winter	Spring
Field Experiments (Agron. 19)	2	2	2
Advanced Crops (Agron. 20)		2	
Types of Farming (Agron. 25)			3
Farm Records and Accounts (Agron. 10)			3
Thesis (Agron. 9)	2	2	2
Irrigation Farming (Agron. 29)			4

Animal Husbandry

Experimental Feeding (A. H. 9)		3	
Thesis (A. H. 10)		3	3
Advanced Judging and Pedigree Study of Dairy Cattle (A. H. 13)			2

Agricultural Education

Practice Teaching (Agr. Ed. 2)	4	4	4
Vocational Agricultural Education (Agr. Ed. 1)		3	
Co-operation and Extension Methods in Field (Agr. Ed. 5)			3
Thesis and Seminar (Agr. Ed. 7)			3

Dairy

Cheese Making (Dairy 4)	4		
Factory Management (Dairy 8)		3	
Dairy Technology (Dairy 10)			3

Horticulture

Greenhouse Construction and Management (Hort. 5)		4	
Landscape Gardening (Hort. 6)	4		
Commercial Fruit Growing (Hort. 7)			5
Thesis (Hort. 8)	2	2	2
Small Fruit Culture (Hort. 15)			2

Poultry Husbandry

Poultry Houses (Poultry 44)	3		
Marketing Poultry Products (Poultry 46)	3		
Advanced Poultry Breeding (Poultry 47)		3	
Poultry Feeds and Feeding (Poultry 45)	3	3	
Thesis (Poultry 49)	2	2	2

Veterinary Science

Pathology (Vet. Sci. 53)		3	
Obstetrics (Vet. Sci. 54)			3

Chemistry

Physiological Chemistry (Chem. 11)		5	
Agricultural Organic Chemistry (Chem. 5)	6		
Quantitative Analysis (Chem. 4)		4	4
Geology (Geol. 1)		4	

Entomology and Zoology

Advanced Economic Entomology (Ento. 6)			4
Embryology (Zool. 8)		5	
General and Systematic Entomology (Ento. 5)	4		
Vertebrate Zoology (Zool. 2)			5

Economics and Sociology

Sociology (Soc. 4)			3
Rural Sociology (Soc. 7)			3
Irrigation Institutions and Economics (Econ. 10)			3
Marketing Farm Products (Econ. 8)			3

Students may choose subjects offered by other departments which are not listed under this grouping.

COURSE IN AGRICULTURE FOR STUDENTS HAVING AN

A. B. OR B. S. DEGREE

This course is intended primarily for persons who desire to teach vocational agriculture in high schools. Those who can satisfy prerequisites for the courses listed may graduate with two years of resident work. Those desiring to major in other departments or to take a more general course will at the direction of the class officer substitute courses for those indicated in education and agricultural education.

JUNIOR YEAR

	Autumn	Winter	Spring
Livestock Judging (A. H. 1, 1a)	3	3	
History of Agriculture (Agron. 12)	2		
Principles of Plant Production (Hort. 1)		3	
Farm Dairying (Dairy 1)	3	3	
Principles of Feeding (A. H. 14)	2		
Breeds of Livestock (A. H. 2, 2a)		4	4
Poultry Management (Poul. 41)	4		
Agricultural Economics (Econ. 6)		3	
Psychology (Ed. 1)	3		
Field Crops (Agron. 1)	3	4	
Forage Crops (Agron. 11)			4
Economic Entomology (Ento. 4)			3
Farm Shop (Agron. 32)			3
Vegetable Gardening (Hort. 12)			3
Theory and Practice of Teaching (Ed. 5)			3

SENIOR YEAR

Veterinary Physiology (Vet. Sci. 51)		4	
Principles of Soil Management (Agron. 21)	3	3	
Organic Evolution (Zool. 9)			4
Beef Cattle and Sheep Production (A. H. 7)		4	
Dry Farming (Agron. 16)	3		
Teaching Practice (Agr. Ed. 2)	4		4
Vocational Agricultural Education (Agr. Ed. 1)		3	
Administration of Vocational Education (Ag. Ed. 3)		2	
Development of Vocational Education (Ed. 2)			3
Dairy Production (A. H. 12)			3
Common Diseases (Vet. Sci. 57)			5
Irrigation (Agron. 14)	3		
Farm Structures (Agron. 26)	3		
Economics (Econ. 3)	3		
Co-operation and Extension Methods (Agr. Ed. 4)		3	

Courses of Instruction

AGRICULTURAL EDUCATION

PROFESSOR M. J. ABBEY

The agricultural education course is designed to prepare persons for teaching vocational agriculture and for agricultural extension work. Courses in psychology, theory and practice and special courses in agricultural education are the basis of the teaching practice which each student is required to do before he completes the course. Students are required to visit high schools in the state where vocational agriculture is taught and work under the instructor for a period of not less than one week at a time. During this period the student is excused from his other college work. Students preparing for extension work will be required to do a limited amount of work with county agents and extension specialists during the last quarter of their senior year.

1. Vocational Agricultural Education. 1 Q. Winter. 3 cr.

For persons preparing to teach vocational agriculture under the provisions of the State and Federal Vocational Act. The meaning of vocational agricultural education, methods of instruction, projects community work, inspections and reports on various types of agricultural schools in the state.

1a. Vocational Agricultural Education. 3 Q. Autumn, winter and spring. 4 cr. Continuous course in itinerant teacher training and follow-up instruction. For persons who are already engaged in teaching vocational agriculture.

2. Teaching Practice in Agriculture. 3 Q. Autumn, winter and spring. Two quarters of 3 cr. required.

The preparation of lessons plans, observation work and under supervision actually teaching secondary classes in agriculture for a period of not less than twenty-four weeks.

3. Administration of Vocational Education. 1 Q. 3 cr.

The fundamental problems of vocational education as they affect the social, political, religious and educational agencies of a community. The possibilities of vocational education in a typical rural com-

munity and how to administer the work, will be the basis of the course.

4. Co-operation and Extension Methods. 1 Q. Winter. 3 cr.

Practical preparation for community leadership and modern methods of co-operative enterprises in agriculture.

5. Co-operation and Extension Methods in the Field. 1 Q. Spring. 3 cr.

An extension of course 4 for persons who desire special preparation for county agent positions. Students will be required to do field work with county agents and specialists, assist in extension schools and community meetings.

6. Supervision. 3 Q. Autumn, winter and spring. Continuous. 3 cr.

A course in itinerant supervision instruction for persons who are teaching in schools receiving aid under the State and Federal Vocational Act.

7. Seminar and Thesis. 1 Q. Spring. 3 cr.

Each student must prepare a suitable thesis upon some phase of agricultural education or closely related subject. The seminar phase of the course will be in the nature of a review of phases of agricultural education taken up in other courses and an intensive study of recent developments in agricultural education.

AGRONOMY

PROFESSORS, P. V. CARDON, F. B. LINFIELD (Dean). ASSISTANT PROFESSORS, E. L. CURRIER, H. E. MURDOCK, L. F. GIESEKER, H. R. SUMNER.

The agronomy courses are designed to afford training in practices of irrigation and dry land farming, including production of field crops, the cultivation of soils, the maintenance of soil fertility, the use of machinery and power, and the management of farms. This aim in this work is to fit men to deal intelligently with the many

problems arising in the development of western agriculture under both dry land and irrigated conditions.

1. Field Crops. 2 Q. Autumn and winter. 7 cr. Prerequisite Botany 1. Fee \$1; deposit \$1. Mr. Sumner.

History, characteristics, uses and methods of growing and marketing wheat, oats, barley, corn, flax, and other cereals; identification and judging of different varieties of grain. Lect. 2; lab. 1; lect. 2; lab. 2.

5. Grain Marketing and Judging. 1 Q. Autumn. 3 cr. Prerequisites Agronomy 1, 11. Fee \$1. Mr. Sumner.

Study of cereal, grass and forage seeds with practice judging. Commercial grading of grain. Lab. 3.

9. Thesis. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cardon.

Senior agronomy students may prepare a thesis on some subject approved by the head of the department not later than November 15.

10. Farm Records and Accounts. 1 Q. 3 cr. Mr. Currier.

Keeping and interpreting farm accounts. Open to juniors and seniors in the college of agriculture. Lect. 1; lab. 2.

11. Forage Crops. 1 Q. Spring. 5 cr. Prerequisite Agronomy 1. Fee \$1; deposit \$1. Mr. Sumner.

History, characteristics and methods of management of grasses, clovers and other crops where the entire plant is cut for hay or used for silage, pasturage or soiling. Lect. 3; lab. 2.

12. History of Agriculture. 1 Q. Autumn. 2 cr. Mr. Linfield. Lect. 2.

15. Drainage. 1 Q. Spring. 3 cr. Open to juniors and seniors in agriculture. Mr. Murdock.

Physical relations and interrelations in soils; effect of water supply on crop growth; excessive moisture; seepage and its control; farm drainage systems; kinds of drains; laying out drainage systems; drainage for irrigation lands. Lect 3.

16. Dry Land Farming. 1 Q. Autumn. 3 cr. Prerequisite Agronomy 2. Mr. Gieseke and Mr. Sumner.

A study of the problems related to dry land farming with par-

ticular reference to Montana and northwestern states. Climate; soil; moisture conservation; tillage methods; cropping systems; and water requirements of crops and their adaptability to dry land conditions. Lect. 2; lab. 1.

17. Field Crop Improvement. 1 Q. Spring. 3 cr. Prerequisites Agronomy 1, 2, 11, Zoology 9. Mr. Cardon.

This is a lecture course dealing with the application of biological principles of field crop improvement.

18. Principles of Agronomic Experimentation. 1 Q. Spring. 1 cr. Prerequisite Agronomy 17. Mr. Cardon.

A lecture course dealing with the principles underlying successful agronomic experimentation. The investigational methods that have resulted in important contributions to agronomic science are reviewed and discussed.

19. Field Experiments. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisites Agronomy 17, 18. Mr. Cardon.

A practical course in which the student is brought into close contact with field methods used in the actual conduct of agronomic experiments.

20. Advanced Crops. 1 Q. Winter. 2 cr. Prerequisites agronomy 1, 5, 11, 18, 19. Mr. Sumner.

A course dealing with special lines of crop production and classification not treated fully in other courses. Special crops such as cotton, tobacco, hemp, rice and root crops may also be studied.

21. Principles of Soil Management. 2 Q. Winter and spring. Continuous. 6 cr. Prerequisites Physics 1a, Chemistry 5, Bacteriology 12. Mr. Giesecker.

Origin, formation and classification of soils, study of the physical properties, influence of tillage, manure and crop rotations on soil moisture, structure, temperature and aeration. Plant food, requirements of crop. Relationship of soil organisms and organic matter to fertility, influence of manure, fertilizers and crop rotations and productive capacity of soil. (Subject matter of the two quarters to be divided along the lines of soil physics and fertility.) Lect. 2; lab. 1.

22. Management of Special Soil Types. 1 Q. Spring. 3 cr. Prerequisite Agronomy 21. Mr. Giesecker.

Method of handling alkali, gumbo, sandy, heavy, clay, muck,

peat and worn-out soils; special soil problems of irrigated and dry farms. Lect. 3.

23. Farm Management. 1 Q. Spring. 3 cr. Open to juniors and seniors in the college of agriculture. Mr. Currier.

A course in which are taught the principles of farm management. Lect. 2; lab. 1.

24. Farm Organization. 1 Q. Spring. 3 cr. Open to juniors and seniors in the college of agriculture. Mr. Currier.

In this course an analysis is made of the factors that have a bearing upon the successful organization of farms in this state. Records of operation on actual farms are used as laboratory material. Lect. 2; lab. 1.

25. Types of Farming. 1 Q. Spring. 3 cr. Prerequisite Agronomy 24. Mr. Currier.

Field trips to study farms and types of farming. Farm analysis studies will be made on farms in the Gallatin valley, illustrating the more important types of farming carried on here. A 100-mile trip by rail will be taken to study farms typical to the plains region of eastern Montana. Lab. 3.

26. Farm Structures. 1 Q. 3 cr. Prerequisites Agronomy 32, Physics 1a. Mr. Murdock.

Farm building construction, arrangement and use, materials, ventilation, lighting, heating. Lect. 2; lab. 1.

27. Irrigation Water Supply. 1 Q. 3 cr. Mr. Murdock.

Sources of water supply, snow and rainfall, runoff; storage; pumping for irrigation; losses of water; location of irrigation systems. Lect. 3.

28. Use of Irrigation Water. 1 Q. 3 cr. Mr. Murdock.

Irrigation compared with humid and dry land, relative cost, measurement and distribution of water, duty of water, measuring devices; methods of applying water. Lect. 2; lab. 1.

29. Irrigation Farming. 1 Q. 3 cr. Prerequisite Agronomy 28. Mr. Murdock.

Preparation of land for irrigation, machinery used; methods of irrigation, leveler, instruments used in laying out farms for irrigation; running laterals, rate of applying water, duty of water, waste, causes and prevention; alkali, swamps, drainage.

30. **Farm Machinery.** 1 Q. 3 cr. Prerequisite Physics 1a. Mr. Murdock.

Development, construction, functions and methods of operating, adjusting and repairing farm implements and machinery. Lect 2; lab. 1.

31. **Farm Motors.** 1 Q. 3 cr. Prerequisite Physics 1a. Mr. Murdock.

Operation, repair and adjustment of farm motors. Special emphasis placed on gasoline engines of the single cylinder stationary type. Lect. 1; lab. 2.

32. **Farm Shop.** 1 Q. 3 cr.

Carpentry: use and care of hand tools in carpentry; practice in working dimensions from blue print.

Forge: Care and manipulation of fire; drawing; upsetting; bending; welding; repair of farm implements. Lab. 3.

ANIMAL HUSBANDRY

PROFESSOR, C. N. ARNETT; ASSISTANT PROFESSORS, R. C. MCCORD, W. E. JOSEPH. INSTRUCTOR, J. O. TRETSVEN.

The course in animal husbandry covers the various phases of livestock production, such as judging, selection, breeding, feeding, care and management for both farm and range conditions.

The aim is to give the student a thorough training in practical and scientific livestock production. The work in judging begins with score card practice and leads to judging groups. Feeding is based upon scientific principles and made as practicable as possible. Study of pedigrees and breeding records gives a knowledge of the most desirable families or strains within different breeds and points the way to livestock improvement. This training fits the student for work in practical and scientific stock farming, also work in teaching and research work in animal husbandry in the various fields.

The equipment of barn, silos, etc., is of modern plan and construction and affords an excellent opportunity for study.

1. **Livestock Judging.** 1 Q. Autumn. 3 cr. Fee \$1. Mr. McCord.

Beef cattle and sheep. Scoring individuals, judging groups, study of livestock markets and market classifications. Lab. 3.

1a. **Livestock Judging.** 1 Q. Winter. 3 cr. Fee \$1. Mr. McCord.

Horses, swine and dairy cattle. Scoring individuals, judging groups, study of livestock markets and market classifications. Lab. 3.

2. Breeds of Livestock. 1 Q. Winter. 4 cr. Prerequisite Animal Husbandry 1. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of beef cattle and sheep; judging breed types. Lect. 3; lab. 1.

2a. Breeds of Livestock. 1 Q. Spring. 4 cr. Prerequisite Animal Husbandry 1a. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of horses, swine, and dairy cattle; judging breed types. Lect. 3; lab. 1.

3. Advanced Stock Judging. 1 Q. Autumn. 2 cr. Prerequisite Animal Husbandry 2, 2a. Fee \$1. Mr. McChord.

Continuation of judging and study of market and breeding stock. Beef cattle, sheep, horses and swine. Lab. 2 .

4. Nutrition of Farm Animals. 1. Q. Autumn. 4 cr. Prerequisite Chemistry 5. Mr. Joseph.

Digestion, metabolism, enzyme changes, functions of nutrients, compounding rations, feeding standards, feeds, their uses and adaptability in the ration. Lect. 4.

6. Breeding Farm Animals. 1 Q. Spring. 3 cr. Prerequisites Animal Husbandry 2, 2a, Zoology 9. Fee \$1. Mr. McChord .

Principles and practices of breeding farm animals, tabulation and study of pedigree. Lect. 3; lab. 1.

7. Beef Cattle and Sheep Production. 1 Q. Winter. 4 cr. Prerequisite Animal Husbandry 14. Mr. Arnett.

Feeding, care and management of purebred and grade beef cattle and sheep. Lect. 4.

8. Horses and Swine Production. 1 Q. Spring. 2 cr. Prerequisite Animal Husbandry 14. Mr. Arnett.

Feeding, care and management of purebred and grade horses and swine. Lect. 2.

9. Experimental Feeding. 1 Q. Autumn. 3 cr. Prerequisites Animal Husbandry 4, 7. Mr. Joseph.

Methods, principles and results of experimental work in animal husbandry. Lect. 2; lab. 1.

10. **Thesis.** 2 Q. Winter and Spring. 3 cr. Mr. Arnett.

Animal husbandry students may select thesis work during the senior year.

11. **Handling and Fitting Livestock.** 1 Q. Spring. 2 cr. Fee \$2. Mr. McChord, Mr. Tretsvén.

Fitting and handling livestock for show, sale, breeding and work. Lab. 1.

12. **Dairy Production.** 1 Q. Spring. 3 cr. Prerequisite Animal Husbandry 14. Mr. Tretsvén.

Feeding, care and management of dairy stock for breeding and milk production. Lect. 3.

13. **Advanced Judging and Pedigree Study of Dairy Cattle.** 1 Q. Spring. 2 cr. Prerequisites Animal Husbandry 1a, 2a. Mr. Tretsvén.

A continuation of judging work as given in 1a and 2a with special emphasis placed on judging groups; detailed study and tabulation of pedigrees of different breeds. Lab. 2.

14. **Principles of Feeding.** 1 Q. Autumn. 2 cr. Mr. Arnett.

Study of feeds, feeding standards, calculating rations and general principles of feeding all classes of livestock. Lect. 2.

DAIRY

PROFESSOR G. L. MARTIN.

The course is designed to fit the student to meet the rapidly growing demand for men trained in practical, modern dairy science as applied to farm, factory and the markets. The positions are financially attractive and offer splendid opportunities for rapid advancement, especially as pertains to educational and commercial lines, factory and corporation management, farm, factory and municipal inspection, manufacturing and marketing.

1. **Farm Dairying.** 1 Q. Autumn. 3 cr. Fee \$2; deposit \$1.

History, distribution and development of the dairy industry, secretion, composition and analysis of milk and cream. Care of milk and cream on the farm, operation of separators, milking machines and coolers. Lect. 2; lab. 1.

1a. **Community Dairying.** 2 Q. Winter. 3 cr. Fee \$2; deposit \$1.

The organization of co-operative dairy marketing associations, preparation and delivery of milk and cream to the local factory pro-

cessing, milk and cream, making butter, cheese and ice cream, advertising sale of dairy products. Lect. 2; lab. 1.

2. Inspection of Milk Products. 1 Q. Autumn. 3 cr. Prerequisites Dairy 1, Chemistry 2. Fee \$2; deposit \$1.

Methods of inspection, scoring stables, dairies, milk depots, factories and markets; composition of milk products in relation to standards of purity. Lect. 2; lab. 1.

3 Creamery Butter Making. 1 Q. Winter. 3 cr. Prerequisite Dairy 1.

Handling cream and making butter on a commercial scale, practice in pasteurizing, making starters; ripening cream, churning, packing and storing of butter. Lect. 2; lab. 1.

4. Cheese Making. 1 Q. Autumn. 4 cr.

Modern methods of making cheddar cheese adapted to farm and factory practice. Lect. 2; lab. 1.

5. Market Milk. 1 Q. Spring. 4 cr. Prerequisite Dairy 1.

Relation of the milk supply to producer, distributor and consumer. Grading and pasteurizing, standardizing, certifying, modifying, bottling and distribution of milk. Lect. 3; lab. 1.

8. Factory Management. 1 Q. Winter. 3 cr. Prerequisite Dairy 3, 4.

Organization, location, planning construction and equipping of factories, handling of by-products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Lect. 2; lab. 1.

10. Dairy Technology. 1 Q. Spring. 3 cr.

Composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts. Lect. 2. lab. 1.

HORTICULTURE

PROFESSOR, —————. ASSISTANT PROFESSOR, C. C. STARRING.

The course in horticulture is designed to prepare students as teachers in agricultural colleges, investigators in agricultural experiment stations, managers of fruit associations and superintendents of commercial orchards and fruit plantations. The West-

ern United States leads the world in methods of orcharding and disposing of orchard products and there is a strong and growing demand for persons properly trained to manage the orchard projects now operated throughout these fruit regions.

1. **Principles of Plant Production.** 1 Q. Winter. 3 cr. Pre-requisite Botany 1. Fee \$1; deposit \$1. Mr. _____.

Propagation of plants by budding, cutting, division, grafting, layering, separation, seeds and spores; methods of gathering and storing seeds. Lect. 2; lab. 1.

4. **Systematic Pomology.** 1 Q. Autumn. 5 cr. Prerequisites Horticulture 1, Botany 1. Fee \$5. Mr. Starring.

Description and naming of varieties of fruit. Judging of exhibition fruit and discussion of score cards. Evolution of cultivated plants, especially fruits. Lect. 2; lab. 3.

5. **Greenhouse Construction and Management.** 1 Q. Winter. 4 cr. Prerequisite Horticulture 1. Mr. _____.

Construction, heating and maintaining of greenhouses; growing plants in greenhouses and conservatories. Lect. 4.

6. **Landscape Gardening.** 1 Q. Autumn. 4 cr. Fee \$1. Mr. Starring.

Laying out and planning of private and public grounds are discussed. Trees, shrubs, and flowers suited to Montana conditions are studied. Lect. 2; lab. 2.

7. **Commercial Fruit Growing.** 1 Q. Spring. 5 cr. Prerequisite Horticulture 13. Mr. _____.

Planting, cultivating, irrigating and managing commercial orchards. Methods of picking, grading, packing and marketing fruits. Lect. 4; lab. 1.

8. **Thesis.** 6 cr. Mr. _____.

Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture.

11. **Commercial Vegetable Growing.** 1 Q. Winter. 5 cr. Pre-requisite Horticulture 12. Mr. Starring.

Organization and management of market and truck gardens; special problems connected with growing vegetables on a large scale.

Preparation of vegetables for market; methods of marketing, storage of vegetables. Lect. 4; lab. 1.

12. **Vegetable Gardening.** 1 Q. Spring. 3 cr. Prerequisites Botany 1, Horticulture 1. Fee \$1. Mr. Starring.

Principles of gardening with special reference to its bearing upon the farm home garden. Potato growing will receive special consideration. Lect. 2; lab. 1.

13. **Fruit Growing.** 1 Q. Winter. 3 cr. Prerequisites Botany 1, Horticulture 1. Fee \$1; deposit \$1. Mr. _____.

Principles of growing tree fruits with special reference to their bearing upon the farm home orchard. Lect. 2; lab. 1.

14. **Trees, Shrubs and Flowers on the Farm.** 1 Q. Autumn. 2 cr. Prerequisites Botany 1, Horticulture 1. Fee \$1. Mr. Starring.

A study of trees, shrubs and flowers adapted to Montana. Principles of planning farmsteads to get desirable ornamental effects. Planting, pruning and other cultural practice with trees, shrubs and flowers. Elective for agricultural students. Lect. 1; lab. 1.

15. **Small Fruit Culture.** 1 Q. Spring. 2 cr. Prerequisites Botany 1, Horticulture 1. Fee \$1. Mr. Starring.

The principles of growing currants, gooseberries, strawberries, raspberries, blackberries and other brambles and grapes. Lect. 1; lab. 1.

POULTRY HUSBANDRY

PROFESSOR, W. F. SCHOPPE.

41. **Poultry Management.** 1 Q. Autumn. 4 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and brooding, preparation for and marketing of poultry products. Lect. 3; lab. 1.

42. **Poultry Breeds.** 1 Q. Autumn. 3 cr.

Origin and development of the more important breeds of poultry, breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lect. 2; lab. 1.

44. Poultry Houses. 1 Q. Autumn. 3 cr.

Planning, arranging and designing poultry houses. Lect. 2; lab. 1.

46. Marketing Poultry Products. 1 Q. Autumn. 4 cr. Fee \$1

Preparation of poultry and eggs for market, storage, preservation, principles of marketing, killing, picking, and packing poultry, drawing, boning and trussing fowls for special market. Candling, grading and packing eggs. Lect. 3; lab. 1.

47. Advanced Poultry Breeding. 1 Q. Winter. 3 cr. Prerequisite Zoology 9.

Breeding birds for show purposes; judging birds, selection and mating of birds for fancy and utility purposes. Lect. 2; lab. 1.

48. Poultry Culture. 1 Q. Winter. 3 cr. Fee \$1.

Breeds of poultry, their care, housing and feeding. Preparation, grading and packing poultry for market. Methods of marketing. Cold storage poultry. Selection of poultry for the table, drawing, trussing and boning. Candling, grading, and packing of eggs for market. Methods of marketing. Preserving eggs for future consumption, methods of storage and means of detecting storage eggs. Elective for junior and senior students in home economics. Lect. 2; lab 1.

49. Incubation. 1 Q. Winter. 3 cr.

History and development of incubation; types of incubators; construction; ventilation; moisture control; operation of incubators; record keeping and pedigreeing. Lect 2; lab. 1.

50. Brooding. 1 Q. Spring. 3 cr.

History and development of brooding; brooding systems; construction and operation of brooders; care and feeding of chicks. Lect. 2; lab. 1.

51. Poultry Feeds and Feeding. 1 Q. Autumn. 3 cr.

Feeds suited to poultry. Analysis of grain mixtures. Composition of feeds. Practice in mixing grain and grain rations. Lect. 2; lab. 1.

52. Poultry Feeding. 1 Q. Winter. 3 cr. Prerequisite Poultry Husbandry 51.

Grain ration for egg production and fattening. Practice in

feeding. Record keeping; computing costs; tabulating data. Lect. 2; lab 1.

53. **Thesis.** 3 Q. Autumn, winter and spring. 6 cr.

Senior students in poultry husbandry may prepare a thesis on some subject approved by the head of the department not later than November 15.

VETERINARY SCIENCE

PROFESSOR, H. WELCH.

51. **Veterinary Physiology and Anatomy.** 1 Q. Winter. 4 cr. Fee \$2.

Physiology and anatomy of domestic animals, digestion and assimilation of food, circulation and functions of the blood, respiration, the nervous system and organs of special sense. Muscles and phenomena of locomotion. Lect. 3; lab. 1.

53. **Pathology.** 1 Q. Winter. 3 cr. Prerequisite Veterinary Science 51.

A study of normal and pathological tissues, causes, course and sequelae of inflammatory processes, tumors, malformations, and the special pathology of the infectious diseases. Gross and microscopic specimens will be used for demonstration. Lect. 3.

54. **Obstetrics.** 1 Q. Spring. 3 cr.

Diseases of animals incident to reproduction. Gestation, normal parturition and dystokia, causes and treatment of sterility, care of the new born. Illustrated by clinic cases. Lect. 2; clinic 1.

56. **Sanitary Science.** 1 Q. Spring. 3 cr. Prerequisite Bacteriology 12 or Veterinary Science 57

Diagnosis, prevention, treatment, quarantine, methods of eradication of the infectious and contagious diseases of animals. Sanitation, the use of vaccines, serum diagnosis. Illustrated by field cases and clinic specimens. Lect. 3.

57. **Common Diseases of Animals.** 1 Q. Spring. 5 cr.

Diagnosis and first aid treatment of the common ailments of livestock. Demonstrations of minor surgical operations, treatment of wounds, and the use of the ordinary medicines and vaccines. Lect. 4; clinic 1.

College of Engineering

This college offers four years courses in Architectural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, and Industrial Chemistry.

The courses of study follow the accepted practice in the leading engineering colleges of the United States, the aim being to instruct the students thoroughly in the fundamental sciences upon which all engineering rests and to impart such special and technical knowledge of the various branches of engineering as will fit the graduates to embark upon successful careers in their chosen fields. Classroom instruction in the fundamental applied sciences is supplemented by practical experience in the field, shops, laboratories and drafting rooms.

In addition to the present facilities, a new engineering building with modern shops and laboratories is assured and should be ready for occupancy by September, 1922. This will place the engineering equipment at the Montana State College amongst the very best in the Northwestern states.

COURSE IN ARCHITECTURAL ENGINEERING.

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
Engineering Mathematics (Math. 1, 2, 3)	5	5	5
Engineering Drawing (E. D. 1, 2, 3)	3	3	3
Architectural Drawing (Art. 3)	2	2	2
Military Science (Mil. Sci. 1)	1	1	1
Seminar (A. E. 26a)	0	0	0
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Engineering Mathematics (Math. 4, 5, 5a)	4	4	4
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
History of Architecture (A. E. 2)	2	2	2
Architectural Drawing (Art. 3a)	3		
Working Drawing (A. E. 1)	3		
Theoretical Mechanics (C. E. 5a, 5b)		3	3
Working Drawings (A. E. 6)		3	
Design (A. E. 4)			3
Military Science (Mil. Sci. 2)	1	1	1
Seminar (A. E. 26b)	0	0	0

JUNIOR YEAR

French (French 1)	4	4	4
History of Architecture (A. E. 3)	2	2	2
Graphics (A. E. 19, 20, 21)	3	3	2
Design (A. E. 22, 23, 24)	4	4	3
Mechanics of Materials (C. E. 6)	5		
Strength of Materials (C. E. 8)		1	
Working Drawings (A. E. 7)		4	
Hydraulics (C. E. 43)			2
Engineering Economics (C. E. 45)			3
Building Sanitation (A. E. 5)			2
Seminar (A. E. 26c)	1	1	1

SENIOR YEAR

Advanced English Composition (Eng. 3)	2	2	2
Economics (Econ. 3)	3	3	
Electrical Equipment of Buildings (E. E. 19)	4		
Concrete Design (C. E. 32)	4		
Steel Mill Buildings (A. E. 11)	3		
Surveying (C. E. 1a)	2		
Architectural Engineering (A. E. 16, 17)		3	2
Thesis (A. E. 12)		3	4
Cement Laboratory (C. E. 34)		2	
Architectural Engineering (A. E. 15)		2	
Heat Engines (M. E. 7)		3	
Heat and Ventilation (M. E. 24)			2
Contracts (C. E. 23)			2
Architectural Engineering (A. E. 18)			3
Building Specifications (A. E. 25)			3
Seminar (A. E. 26d)	1	1	1

COURSE IN CHEMICAL ENGINEERING AND INDUSTRIAL CHEMISTRY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	6
Engineering Mathematics (Math. 1, 2, 3)	5	5	5
Seminar (Chem. 22)	0	0	0
Physical Education (Phys. Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1
College Education (Ed. 10)	0		

Chemical Engineering

Engineering Drawing (E. D. 1, 2, 3)	3	3	3
Shop Work (M. E. 4, 2)	2	2	

Industrial Chemistry

Electives	5	5	3
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SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Qualitative Analysis (Chem. 2)	5		
Quantitative Analysis (Chem. 3)		5	5
Engineering Mathematics (Math. 4, 5, 5a)	4	4	4
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Seminar (Chem. 20)	1	1	1
Physical Education (Phys. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Physical Chemistry (Chem. 19)		5	5
Organic Chemistry (Chem. 9)	5	5	5
Quantitative Analysis (Chem. 4)	4		
Engineering Chemistry (Chem. 12)	2		4
Seminar (Chem. 20)	1	1	1

Chemical Engineering

Mechanism (M. E. 8, 8a)	4	1	
Theoretical Mechanics (C. E. 5a, 5b)		3	3

Industrial Chemistry

Electives	4	4	3
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SENIOR YEAR

Advanced English Composition (Eng. 3)	2	2	2
Industrial Chemistry (Chem. 14)	5	4	5
Electro Chemistry (Chem. 23)	5		
Water Analysis (Chem. 18)			4
Fuel and Oil Analysis (Chem. 17)		3	
Seminar (Chem. 20)	1	1	1

Chemical Engineering

Electro Power (E. E. 14, 14a)		3	4
Heat Engines (M. E. 7)		3	
Mechanics of Materials (C. E. 6)	5		
Hydraulic Engineering (C. E. 48)			3
Mechanical Laboratory (M. E. 15a)		2	

Industrial Chemistry

Electives	5	8	7
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COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
Engineering Mathematics (Math. 1, 2, 3)	5	5	5
Engineering Drawing (E. D. 1, 2, 3)	3	3	3
Land Surveying (C. E. 1)	2	2	2
Seminar (C. E. 12a)	0	0	0
Military Science (Mil. Sci. 1)	1	1	1
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Engineering Mathematics (Math. 4, 5, 5a)	4	4	4
Physical Measurements (Phys. 2)	2	2	2
Engineering Physics (Phys. 1)	3	3	3
Plane Surveying (C. E. 2)	3		
Highway Engineering (C. E. 7)	3		
Topographical Mapping (E. D. 4)		3	
Theoretical Mechanics (C. E. 5a, 5b)		3	3
Railroad Engineering (C. E. 4)			3
Seminar (C. E. 12b)	0	0	0
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Mechanics of Materials (C. E. 6)	5		
Graphic Statics (A. E. 19)	3		
Railroad Economics (C. E. 9)	4		
Precise Surveying (C. E. 17)	3		
Hydraulics (C. E. 37)		4	
Strength of Materials (C. E. 8)		1	
Roofs and Bridges (C. E. 29)		4	
Hydraulic Engineering (C. E. 15)		2	5
Geology (Geol. 1)		4	
Engineering Economics (C. E. 45)			3
Bridge Design (C. E. 30)			5
Highway Engineering (C. E. 47)			4
Hydraulic Laboratory (C. E. 38)			1
Seminar (C. E. 12c)	1	1	1

SENIOR YEAR

Irrigation Engineering (C. E. 36, 40)	4	3	
Concrete Design (C. E. 32)	4		
Municipal Engineering (C. E. 3)	3		
Highway Engineering (C. E. 35)	3		
Seminar (C. E. 12d)	1	1	1
Dams and Retaining Walls (C. E. 31)		3	
Electric Power (E. E. 14)		3	
Heat Engines (M. E. 7)		3	
Foundations (C. E. 21)			4
Engineering Contracts (C. E. 23)			2
Thesis (C. E. 27)			3-5
Sanitary Engineering (C. E. 14)		3	3
Electives	3	2	5-3

COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
Engineering Mathematics (Math. 1, 2, 3)	5	5	5
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
Engineering Drawing (E. D. 1, 2, 3)	3	3	3
Shop Work (M. E. 9, 4, 2)	2	2	2
Military Science (Mil. Sci. 1)	1	1	1
Seminar (E. E. 17a)			
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Engineering Mathematics (Math. 4, 5, 5a)	4	4	4
Theoretical Mechanics (C. E. 5a, 5b)		3	3
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Electrical Machinery (E. E. 1)	3		
Electrical Diagrams (E. E. 7)	1	1	1
Machine Work (M. E. 21)	2		
Surveying (C. E. 1a)		2	2
Military Science (Mil. Sci. 2)	1	1	1
Seminar (E. E. 17b)			

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Engineering Economics (C. E. 45)			3
Mechanics of Materials (C. E. 6)	5		
Electricity and Magnetism (Phys. 5)	3	3	
Direct Currents (E. E. 3)	3	3	4
Dynamo Design (E. E. 8)	1	2	3
Electrical Laboratory (E. E. 4)	1	1	2
Heat Engines (M. E. 7)		3	
Hydraulics (C. E. 48)			3
Mechanical Laboratory (M. E. 15a)		2	
Seminar (E. E. 17c)	1	1	1
Strength of Materials (C. E. 8)	1		
Mechanical Practice (M. E. 3)			2

SENIOR YEAR

Alternating Currents (E. E. 9a, 9b, 9c)	4	4	4
Electric Design (E. E. 12a, 12b, 12c)	3	3	3
Electrical Laboratory (E. E. 10a, 10b, 10c)	3	3	2
Seminar (E. E. 17d)	1	1	1
Thesis (E. E. 20a, 20b, 20c)	1	3	4
Contracts and Specifications (C. E. 23)			2
Engineering of Power Plants (M. E. 26a)	3		
Elective	3	4	2

COURSE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
Engineering Mathematics (Math. 1, 2, 3)	5	5	5
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
Engineering Drawing (E. D. 1, 2, 3)	3	3	3
Surveying (C. E. 1a)	2		
Forging (M. E. 9)		2	
Foundry (M. E. 4)			2
Military Science (Mil Sci. 1)	1	1	1
Seminar (M. E. 11a)			
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Engineering Mathematics (Math. 4, 5, 5a)	4	4	4
Engineering Physics (Phys. 1)	3	3	3
Physical Measurements (Phys. 2)	2	2	2
Mechanism (M. E. 8)	3		
Theoretical Mechanics (C. E. 5a, 5b)		3	3
Kinematic Drawing (M. E. 8a)	1	1	1
Pattern Work (M. E. 2)	2		
Mechanical Practice (M. E. 3)		2	
Machine Work (M. E. 21)			2
Military Science (Mil. Sci. 2)	1	1	1
Seminar (M. E. 11b)			

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Engineering Economics (C. E. 45)			3
Mechanics of Materials (C. E. 6)	5		
Strength of Materials (C. E. 8)		1	
Valve Gears (M. E. 10)	2		
Electric Power (E. E. 14, 14a)		3	4
Machine Elements (M. E. 13)		3	3
Steam Engines and Boilers (M. E. 17)	4		
Thermodynamics (M. E. 18)		4	4
Mechanical Laboratory (M. E. 14, 20)	2	2	2
Machine Work (M. E. 21, 27)	2	2	
Heat Treatment of Steels (M. E. 5)			2
Seminar (M. E. 11c)	1	1	1

SENIOR YEAR

Gas Power Engineering (M. E. 22)	4		
Mechanical Engineering of Power Plants (M. E. 26)		4	
Heat and Ventilation (M. E. 24)			2
Contracts and Specifications (C. E. 23)			2
Machine Design (M. E. 23)	3	3	3
Manufacturing Methods and Machinery (M. E. 31)	3		
Mechanical Laboratory (M. E. 28)	2		
Hydraulics (C. E. 37)		4	
Hydraulic Laboratory (C. E. 38)			1
Industrial Organization and Management (M. E. 25)			3
Seminar (M. E. 11d)	1	1	1
Thesis (M. E. 30)	2	2	2
Elective	3	4	4

Courses of Instruction

ARCHITECTURAL ENGINEERING

PROFESSOR, W. R. PLEW; LECTURER, FRED F. WILLSON; —————

The course is intended to provide training which the student will need to prepare himself for the practice of architecture as a profession .

In addition to the science which is common to all engineering courses, this course includes a thorough training in freehand drawing, the basis of all architectural design. Ancient and modern architecture are studied historically so that the student may become acquainted with the best examples and draw inspiration from them for design. The construction of steel and concrete buildings, the sanitation of buildings, interior and exterior decoration, heating and ventilation and illumination form important parts of the instruction given.

1. **Working Drawings.** 1 Q. 3 cr. Prerequisite Engineering Drawing 1.

A systematic study of the characteristic properties of wood and wood framing; building details. Lab. 3.

2. **History of Architecture.** 3 Q. Autumn, winter and spring. Continuous. 2 cr.

History of architecture as a record of civilization up to the Gothic. Lect. 2.

3. **History of Architecture.** 3 Q. Autumn, winter and spring. Continuous. 2 cr.

A continuation of architectural engineering 2 beginning with Gothic and covering all periods down to modern architecture. Lect. 2.

4. **Elementary Design.** 1 Q. Spring. 3 cr. Prerequisite Art 3a. Study of orders in detail; rendering in India ink. Lab. 3.

5. **Building Sanitation.** 1 Q. Spring. 2 cr.

Design of plumbing installation; traps, water closets, private systems of water supply, and sewage disposal. Lect. 2.

6. Specifications and Working Drawings. 1 Q. Winter. 3 cr. Prerequisite Architectural Engineering 1 .

Making complete working drawings for a frame residence with specifications. Lab. 3.

7. Specifications and Working Drawings. 1 Q. Winter. 3 cr. Prerequisite Architectural Engineering 6.

Making complete plans for a small masonry building with specifications. Lab. 3.

8. Estimating. 1 Q. 3 cr. Prerequisite Architectural Engineering 7.

Estimating of building costs, by quantity method. Lect. 3.

10. Architectural Decoration. 1 Q. 3 cr.

Interior and exterior application of ornament from the technical side. Lect. 3

11. Steel Mill Building. 1 Q. Spring. 2 cr. Prerequisite Architectural Engineering 19.

Design of steel roof trusses; framed bents; mill building details. Lab 3.

12. Thesis. 1 Q. Spring. 4 cr.

A complete design of some moderate sized public building. Lab. 4.

13. House Planning. 1 Q. Spring. 2 cr.

An elementary course in house planning for home economics students. Lab 2.

14. Masonry Construction. 1 Q. 4 cr. Prerequisite Architectural Engineering 7.

Study of building stones and their preparation for use. Design of masonry construction applied to buildings. Lect. 1; lab. 3.

15. Architectural Engineering. 1 Q. Winter. 2 cr. Prerequisite Architectural Engineering 11.

Design of steel frame work in modern building construction; fire-proof construction steel. Lab. 2.

16. Architectural Engineering. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 32.

Principles of concrete design applied to warehouse or construction. Lab. 3.

17. Architectural Engineering. 1 Q. Spring. 2 cr. Prerequisite Architectural Engineering 16.

A continuation of architectural engineering 15 to include high office buildings; wind bracing, secondary trusses; foundations and grillage. Lab. 2.

18. Architectural Engineering. 1 Q. Spring. 3 cr. Prerequisite Architectural Engineering 16.

A continuation of architectural engineering 16 to include the modern fireproof concrete building; flat slab.

19. Graphics. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 5.

Fundamentals of graphic statics; roof and bridge trusses; dead and moving loads. Lab. 3.

20. Graphics. 1 Q. Winter. 3 cr. Prerequisite Architectural Engineering 19.

Continuation of architectural engineering 19; secondary stresses. Lab. 3.

21. Graphics. 1 Q. Spring. 2 cr. Prerequisite Architectural Engineering 20.

Continuation of architectural engineering 20; one, two, and three hinged arch trusses; vaults, domes. Lab. 2.

22. Design. 1 Q. Autumn. 4 cr. Prerequisite Architectural Engineering 4.

Plan and sketch problems; presentation.

23. Design. 1 Q. Winter. 4 cr. Prerequisite Architectural Engineering 22.

Continuation of architectural engineering 22.

24. Design. 1 Q. Spring. 3 cr. Prerequisite Architectural Engineering 23.

A continuation of architectural engineering 23 to include some structures of monumental character.

25. Building Specifications. 1 Q. Spring. 3 cr. Prerequisite Architectural Engineering 7.

A study of various specifications for good building; compiling a complete set of specifications.

26a, b, c, d. Seminar. 3 Q. Autumn, winter and spring. Continuous. 3 cr.

Freshmen and sophomore students are required to attend the weekly seminar without credit.

Junior and senior students are required to prepare and present papers upon assigned architectural or engineering topics at the weekly seminar period.

CHEMICAL ENGINEERING AND INDUSTRIAL CHEMISTRY

PROFESSOR, W. M. COBLEIGH. ASSISTANT PROFESSORS, E. J. QUINN, R. C. SHERWOOD. INSTRUCTOR, L. C. HUMPHREY. ASSISTANT, A. P. STARK. SPECIAL LECTURER, W. H. ANDREWS, Chief Chemist, Three Forks Portland Cement Company—Clays and Cement Making Materials.

The courses of instruction that constitute the four years course in chemical engineering and industrial chemistry are chosen to train men to take a leading part in the development and operation of those industries and manufacturing pursuits which are based on the applications of chemistry.

The work of the course in chemical engineering can be classified in three groups: First, courses which provide a thorough knowledge of the principles of general, analytical, physical, organic and industrial chemistry; second, those courses which provide a knowledge of mathematics, physics, and engineering including both mechanical and electrical engineering subjects; third, courses which give the student training in chemical engineering proper. In these courses, the principles of chemistry and of engineering are applied to industrial operations.

In the course in industrial chemistry engineering subjects are not required and in place of these subjects the student may take elective courses subject to the approval of the class adviser.

Inspection trips are made to the various industrial plants in the state. The studies carried on at these plants are carefully systematized in order to give the student an opportunity to observe the application of the principles of chemistry and chemical engineering.

1, 1a, 1b. **General Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 12 or 14 credits. Fee \$5; deposit \$3. Mr. Cobleigh, Mr. Quinn, Mr. Humphrey, Mr. Stark and assistants.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds, and elementary qualitative analysis. Lect. 2; lab. 2.

This class is taught in sections:

Section 1. For students who present high school units in chemistry for entrance.

Section 2. For students who have not had high school chemistry.

2. **Qualitative Analysis.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Quinn.

The course is presented from the standpoint of modern theories of chemistry. Lect. 3; lab. 2.

3. **Quantitative Analysis.** 2 Q. Winter and spring. 10 cr. Prerequisite Chemistry 2. Fee \$4; deposit \$4. Mr. Quinn.

Theory and technique of the methods of analytical chemistry and chemical calculations. Lect. 2; lab. 3.

4. **Quantitative Analysis.** 3 Q. Autumn, winter and spring. Continuous. 12 or 15 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4.

A continuation of chemistry 3. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 2. Lect. 2; lab. 3.

9. **Organic Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 1, 2. Fee \$4; deposit \$4. Mr. Sherwood.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

12. **Engineering Chemistry.** 2 Q. Autumn and spring. 2 and 4 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel and copper. Qualitative and approximate quantitative examinations of the materials listed above as an aid in studying their chemical properties. Lect. 2; lect. 2; lab. 2.

14. **Industrial Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 2, 3, 9. Fee \$4; deposit \$4. Mr. Cobleigh.

The application of chemistry to the industries, including operations common to many chemical industries, such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspection and reports on various industrial plants in the state. The laboratory work in the spring quarter is taught from the viewpoint of chemical engineering. Lect. 3; lab. 2.

17. **Fuel and Oil Analysis.** 1 Q. Winter or spring. 3 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Production and analysis of solid, liquid, and gaseous fuels, illuminating gas and lubricating oils. Lect. 1; lab. 2.

18. **Water Analysis.** 1 Q. Winter or spring. 4 cr. Prerequisites Chemistry 1, 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewage and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. **Physical Chemistry.** 2 Q. Winter and spring. 10 cr. Prerequisites Chemistry 3, Mathematics 5 or 16. Fee \$4; deposit \$4. Mr. _____.

Theoretical chemistry, including stoichiometry, radio-activity, the electron theory, the gas laws, kinetic theory of gases, liquids, solids, colloids, osmotic pressure, theory of solution and the phase rule. Lect. 3; lab. 2.

20. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Sherwood.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals and present them at weekly meetings of the students and department instructors, where the topics are discussed. Lect. 1.

21. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr. Quinn, Mr. Sherwood.

Students in the chemistry course may, in the senior year, prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab 2.

22. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Sherwood.

Serves the purpose of a so-called orientation course designed to give the freshmen in chemistry and chemical engineering an appreciation of the field of chemistry in practical affairs, and to give a more adequate outlook on the training required by professional chemists.

23. **Electro Chemistry.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 19. Fee \$2; deposit \$2. Mr. _____.

Including the following topics: Electrical conductance, equilibrium, hydrolysis, electromotive force, electrolysis, polarization, electro analysis, electroplating, electric furnaces, applied electro chemistry.

CIVIL ENGINEERING

PROFESSOR, L. D. CONKLING. ASSISTANT PROFESSOR, E. L. GRANT.

The civil engineering course is arranged to give a broad training in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems, they are taught the underlying principles of engineering and inspired with a desire to do their best work. The students study many problems connected with the location and construction of railroads, public highways, bridges, water works, water power development, irrigation, sewage systems, and sewage disposal, city and municipal engineering.

Students in civil engineering who desire to specialize in irrigation may substitute the irrigation subjects listed from civil engineering 36 to civil engineering 42 in place of some of the civil engineering work as tabulated on page 69.

1. **Land Surveying.** 3 Q. Autumn, winter and spring. 6 cr. Prerequisite Mathematics 2. Fee \$1; deposit \$2. Mr. Grant.

Theory, adjustment and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping. Lab. 2.

1a. **Surveying.** 3 Q. Autumn, winter and spring. 2 to 6 cr. Prerequisite Mathematics 2. Fee \$1; deposit \$2. Mr. Grant.

Theory, adjustment and use of instruments in land surveying, hydrography, water measurement, irrigation and drainage, plotting and mapping, draughting and office work. Lab. 2.

2. **Plane Surveying.** 1 Q. Autumn. 3 cr. Prerequisites Mathematics 2, Civil Engineering 1. Fee \$1; deposit \$2. Mr. Grant.

Computation of areas, dividing of land, the methods of field, hydrographic, mine and city surveying, barometric and spirit leveling, computation of earth work; map drawing and topographic signs; field work with transit level, and plane table; map drawing from students' field notes. Lab. 3.

3. **Municipal Engineering.** 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 2. Mr. Conkling.

City planning, allotting and platting additions; construction of streets, sidewalks, curbs, gutters, and parkings; disposal of refuse; city parks and their paths, walks and roadways; law affecting the work of the city engineer. Lect. 3.

4. Railroad Engineering. 1 Q. Spring. 3 cr. Prerequisite Civil Engineering 2. Fee \$1; deposit \$2. Mr. Grant.

Railroad reconnoissance, preliminary and location surveys. Railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts, and crossings. Lab. 3.

5a, 5b. Theoretical Mechanics. 2 Q. Winter and spring. 6 cr. Prerequisite Mathematics 4. Mr. Grant.

Forces and force systems, center of gravity and centroids, stress, principles of equilibrium, rectilinear and curvilinear motion, work and energy, impulse, momentum and vectors. Lect. 3.

6. Mechanics of Material. 1 Q. Autumn. 5 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

Elasticity and strength of timber, brick, stone, and metals. Theory of beams, columns, and shafts. Lect. 5.

6a. Applied Mechanics. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 5. Mr. Conkling.

A short course in the study of the elasticity and strength of the building materials, and the theory of simple beams and short columns. Lect. 3.

7. Highway Engineering. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 1. Mr. Conkling.

Preliminary investigations; surveying, mapping and design; grading, drainage, and foundations. Lect. 3.

8. Strength of Materials. 1 Q. Autumn or winter. 1 cr. Prerequisite Civil Engineering 6. Fee \$2; deposit \$2. Mr. Conkling.

Experimental determinations of the strength of the several moduli of the more important of the materials of engineering. Lab. 1.

9. Railroad Economics. 1 Q. Autumn. 4 cr. Prerequisite Civil Engineering 4. Fee \$1; deposit \$2. Mr. Grant.

Making of profiles, field maps, cross-sections, etc., from students' notes of the field work. Economics of railroad location; arrangement of yards, terminals, and stations. Making location map. Construction of the roadbed. Maintenance of way and the elements of railroad operation. Lect. 1; lab. 3.

12a, b, c. Seminar. 3 Q. Autumn, winter and spring. 3 cr. Mr. Conkling.

Freshmen and sophomore students are required to attend the weekly seminar without credit.

Junior and senior students are required to prepare and present papers upon assigned engineering topics at the weekly seminar period.

14. Sanitary Engineering. 2 Q. Winter and spring. 6 cr. Prerequisites Civil Engineering 1, 3, 15. Mr. Conkling.

Methods of sewage treatment and disposal. The design of a sewage system and a disposal plant; house drainage; specifications and estimate of cost. Lect. 3. Lect. 1; lab. 2.

15. Hydraulic Engineering. 2 Q. Winter and spring. 7 cr. Prerequisites Civil Engineering 37, 38 Mr. Conkling.

Precipitation, drainage area, runoff, storage, public water supply, reservoirs, pipe lines, pumping plants, purification plants, power development, etc. Lect. 2. Lect. 3; lab. 2.

17. Precise Surveying. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 4. Mr. Grant.

Study of the different methods of making topographic and hydrographic surveys. Control of the survey. Topographic details. Hydrographic surveying. Mapping. Lab. 3.

21. Foundations and Masonry. 1 Q. Spring. 4 cr. Prerequisites Civil Engineering 6, 28. Mr. Conkling.

Materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; specifications and costs. Lect. 3; lab. 1.

23. Contracts and Specifications. 1 Q. Spring. 2 cr. Mr. Conkling.

Correct form of specifications and judicial interpretation placed on technical terms commonly used in engineering specifications. Elective to all engineering students after the sophomore year. Lect. 2.

27. Thesis. 1 Q. Spring. 3 or 5 credits. Mr. Conkling.

The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. Subject must be chosen at the beginning of the senior year.

28. Graphic Statics. 1 Q. Autumn. 3 cr. Prerequisites Physics 1, 2, Civil Engineering 5. Fee \$1; deposit \$2. Mr. Conkling.

Stresses in roof trusses by the force polygon. Application of equilibrium polygon to beams and girders. Stresses in bridge trusses, retaining walls and masonry arches. Lab. 3.

29. Roofs and Bridges. 1 Q. Winter. 4 cr. Prerequisites Civil Engineering 6, 28. Mr. Conkling.

Theory and computation of stress in roof and bridge trusses under dead, live, and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Lect. 4 .

30. Bridge Design. 1 Q. Spring. 5 cr. Prerequisites Civil Engineering 6, 29. Mr. Plew.

Designing of girders and trusses; computation and complete drawings for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of materials and estimate of cost. Lect. 1; drawing 4.

31. Dams and Retaining Walls. 1 Q. Winter. 3 cr. Prerequisite Civil Engineering 32.

Theory and design of earth, masonry and concrete dams and retaining walls. Lect. 1; lab. 2.

32. Concrete Design. 1 Q. Autumn. 4 cr. Prerequisites Civil Engineering 6, 30. Deposit \$2. Mr. Plew.

Design of reinforced concrete beams and slabs, reinforced concrete buildings and other structures. A complete design of a reinforced concrete arch by the Elastic Theory. Specifications and costs. Lect. 2; lab. 2.

34. Cement Laboratory. 1 Q. Winter. 2 cr. Prerequisite Civil Engineering 6. Fee \$2; deposit \$2. Mr. Conkling.

Manufacture and properties of hydraulic cement, proportioning and mixing concrete. Standard tests of sand and cement. Test of concrete beams, etc. Lab. 2.

35. Highway Engineering. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 47. Mr. Conkling.

Roads and pavements, contracts and specifications; methods of financing; organization and administration; legislation and state laws. Lect. 2; lab. 1.

36. Irrigation Engineering. 1 Q. Autumn. 4 cr. Prerequisite Civil Engineering 37. Mr. Conkling.

History of irrigation; the principles of irrigation and location of irrigation systems. Lect. 4.

37. Hydraulics. 1 Q. Winter. 4 cr. Prerequisites Mathematics 5, Physics 1, 2. Mr. Grant.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Lect. 4.

38. Hydraulic Laboratory. 1 Q. Spring. 1 cr. Prerequisite Civil Engineering 37. Fee \$2; deposit \$2. Mr. Conkling.

Flow of water over weirs, through nozzles and pipes, open channels and conduits, etc. Lab. 1.

39. Canal Surveying. 1 Q. Autumn. 3 cr. Prerequisite Civil Engineering 1. Fee \$1; deposit \$2. Mr. Grant.

Theory and practice of canal surveying, computation of earth work, field location of canals and ditches for irrigation. Lect. 1; field work 2.

40. Irrigation Engineering. 1 Q. Winter. 3 cr. Prerequisites Civil Engineering 36, 37, 38. Mr. Conkling.

Manner of supplying, storing, conveying and distributing irrigation water; management of irrigation systems; irrigation laws. Lect. 3.

41. Canal Management. 1 Q. Spring. 3 cr. Prerequisite Civil Engineering 40. Mr. Conkling.

Canal management, seepage and drainage. Lect. 3.

42. Pumping for Irrigation. 1 Q. Spring. 3 cr. Prerequisites Civil Engineering 37, 38, Mechanical Engineering 15a. Mr. Conkling.

Small rotary and reciprocating pumps. Steam, gas, and oil engines used for pumping. Electric motor driven pumps. Lect. 3.

43. Elementary Hydraulics. 1 Q. Spring. 2 cr. Prerequisites Mathematics 1, 2, 4, Physics 1, 2. Mr. Conkling.

Elementary course in theoretical hydraulics for students in architectural engineering. Course given each alternate year beginning February, 1920.

44. Concrete Construction. 2 Q. Winter and spring. 6 cr. Prerequisite Civil Engineering 6a. Fee \$2; deposit \$2. Mr. Conkling.

A study of cement and cement products; their manufacture, storage, etc. The effects of impurities, proportioning and mixing aggregates, upon the strength and life of concrete. The design and methods of construction of simple concrete structures, such as floors, walks, flumes, troughs, small culverts, small cisterns, etc. Lect. 1; lab. 2.

45. Engineering Economics. 1 Q. Spring. 3 cr. Prerequisite Economics 3. Mr. Grant.

A study of economic questions of interest to engineers and others engaged in the industries, including methods of valuation of public utilities, commerce commission reports, determination of most

economic machines, annuities, interest, perpetuities, present worth, etc.

47. Highway Engineering. 1 Q. Spring. 4 cr. Mr. Conkling. Roads and paving materials. Their inspection and laboratory tests. Lect. 2; lab. 2.

48. Hydraulic Engineering. 1 Q. Spring. 3 cr. Mr. Grant.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Fundamental theory of water wheels and water power development. For electrical engineering students. Lect. 3.

ELECTRICAL ENGINEERING

PROFESSOR, J. A. THALER. ASSISTANT PROFESSOR, R. D. SLOAN.

The course in electrical engineering is designed to give a thorough technical training in which theoretical subjects and the application of theory to the solution of practical problems are emphasized.

The general training consists of courses in English, mathematics, physics, chemistry, drawing and shop work. The technical work covers the theory and application of electrical phenomena, and the designing and testing of electrical machines and apparatus.

The equipment of the electrical laboratory includes apparatus of modern type, as well as machines of historical value. The laboratories contain various types of direct and alternating current dynamos and motors, storage batteries, an oscillograph, a 150,000 volt transformer, a wireless station, and other equipment.

1. Electrical Machinery. 1 Q. Autumn. 3 cr. Mr. Thaler.

Construction, care and operation of commercial electrical machinery and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers, and electrical measuring instruments. Lect. 3.

3. Direct Currents. 3 Q. Autumn, winter and spring. 10 cr. Prerequisites Physics 1, Mathematics 4. Mr. Sloan.

Principles of electro-magnetism, theory of dynamo electric machines, design, construction and regulation of direct current machines. Lect. 2, 3, and 4.

4. Electrical Laboratory. 3 Q. Autumn, winter and spring. 4 cr. Prerequisite Physics 2. Fee \$1; deposit \$5. Mr. Sloan.

Determination of armature and field resistance; magnetic leak-

age, coefficient and regulation of various types of direct current machines. Lab. 1, 1, and 2.

7. Electrical Diagrams. 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Sloan.

Conventional methods of representing electrical wiring and appliances. National Electrical Code. Diagrams of D. C. Switchboards and electric light wiring. General and detail drawing of dynamos. Lab. 1, 1, and 1.

8. Dynamo Design. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite Electrical Engineering 7. Mr. Sloan.

Designing electro-magnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Lab. 1, 2, and 3.

9. Alternating Currents. 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite Physics 5. Mr. Thaler.

Theory of alternating currents, properties of alternating current circuits, principles of alternators, transformers, rotary converters and induction motors. Lect. 4.

10. Electrical Laboratory. 3 Q. Autumn, winter and spring. Continuous. 8 cr. Prerequisite Physics 5. Fee \$1; deposit \$5. Mr. Thaler.

Tests of alternating current generators, motors and transformers, calibration of alternating current measuring instruments. Lab. 3, 3 and 2.

13. Electrical Design. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Thaler, Mr. Sloan.

Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking electrical engineering. Lab. 3.

14. Electrical Power. 1 Q. Winter. 3 cr. Mr. Sloan.

Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Lect. 3.

14a. Electrical Power. 1 Q. Spring. 4 cr. Prerequisite Electrical Engineering 14. Fee \$1; deposit \$5. Mr. Sloan.

Industrial application of electricity. Electrical equipment of power stations and sub-stations. Efficiency and regulation tests of batteries, transformers, direct and alternating current generators and motors. Lect. 3; lab. 1.

15. **Radio Telegraphy.** 3 Q. Autumn, winter and spring. Continuous. Credits variable. Mr. Thaler.

Theory and practice of radio telegraphy, code instruction, practice in adjusting and operating field sets. Lect. 1; lab. 2.

17. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Thaler.

Weekly meetings for the purpose of discussing current electrical engineering literature. Lect. 1.

18. **Special Design.** Credits variable. Mr. Thaler.

Design and construction of some special electrical apparatus or machine. Elective for seniors.

19. **Electrical Equipment of Buildings.** 1 Q. Autumn. 4 cr. Mr. Sloan.

Electrical distribution and equipment for buildings; Underwriters' rules, communication and signal systems, light lighting units, photometry and illumination.

20. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 8 cr. Mr. Thaler.

Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. The subject for the thesis must be chosen at the beginning of the senior year.

MECHANICAL ENGINEERING

PROFESSOR, EARLE B. NORRIS, (Dean). ASSISTANT PROFESSORS, R. T. CHALLENGER, ERIC THERKELSEN, A. LUDWIG. INSTRUCTORS, F. C. HOMANN, F. W. KATELY, F. L. GRIFFIN.

The course in mechanical engineering aims to furnish fundamental training in the design, construction, testing and operation of power and manufacturing machinery, and in the management of manufacturing operations and enterprises. Closely correlated instruction and training by text book, lecture, laboratory and shop practice acquaint the student both theoretically and practically with the forces which he must control, with the qualities and values of the materials of engineering, and with the practical and economic considerations which govern design and construction. One of the prime considerations is to develop original thinking and conceptions based on solid scientific and practical lines.

In addition to the technical instruction, the student is familiarized with the present day industrial problems and with the modern

business methods in industrial organization. The course is planned to give a general training for the broad field of the mechanical engineer by a thorough grounding in the fundamentals rather than intense specialization, but some opportunity for specialization in a chosen line, or for broader cultural studies is offered by electives in the senior year.

2. **Pattern Work.** 1 Q. Autumn, winter or spring. 2 cr. Prerequisite Mechanical Engineering 4. Fee \$2; deposit \$2. Mr. Griffin.

Allowance for draft, shrinkage and finish; construction of patterns of machine parts, with necessary core-boxes. Lab. 2.

3. **Mechanical Practice.** 1 Q. Winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Homann.

Belt lacing; knots, lashing, splicing; steam fitting; babbitting; bearings; machine assembling and erecting; aligning shafting. Lab. 2.

4. **Foundry Work.** 1 Q. Autumn, winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Floor and bench moulding; core making; cupola charging; pouring casting of gray iron, brass and other alloys. Lab. 2.

4a. **Advanced Foundry Work.** 1 Q. Winter. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Advanced moulding and core work; cupola management; foundry equipment and arrangement. In this course the student is expected to take charge of the cupola in running a heat. Lab. 2.

5. **Heat Treatment of Steels.** 1 Q. Spring. 2 cr. Fee \$2; deposit \$2. Mr. Homann.

Hardening, tempering and annealing; case-hardening; heat treatment of alloy steels; testing physical properties and structures; gas, electric and thermit welding. Lab. 2.

7. **Heat Engines.** 1 Q. Winter. 3 cr. Prerequisites Mathematics 4, Physics 1, 2. Mr. Therkelsen.

Steam boiler types; boiler construction; combustion of fuels; furnace efficiency; types of steam engines; engine economics; internal combustion engines. Lect. 3.

8. **Mechanism.** 1 Q. Autumn. 3 cr. Prerequisites Engineering Drawing 1, Mathematics 2. Mr. Challender.

Relative motions of machine parts; linkwork; belting; cams; systems of gear teeth; spur, bevel, helical and worm gears; gear trains; planetary gearing. Lect. 3.

8a. Kinematic Drawing. 3 Q. Autumn, winter and spring. 3 cr. Taken with Mechanical Engineering 8. Mr. Challender.

Drafting room problems in the laying out of different types of mechanism to perform given functions. Lab. 1.

9. Forging. 1 Q. Autumn, winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Care of the fire; practice in forging, including drawing, bending, upsetting, and pointing of iron and steel; welding of mild steel and iron; working of tool steel. Lab. 2.

10. Valve Gears. 1 Q. Autumn. 2 cr. Prerequisite Mechanical Engineering 8. Taken with Mechanical Engineering 17. Mr. Challender.

The simple slide valve; valve diagrams; valve setting; reversing motions; riding cut-off; Corliss and poppet valve mechanisms. Lect. 1; lab. 1.

11a, b, c, d. Seminar. 3 Q. Autumn, winter and spring. 3 cr. Mr. Norris.

Freshmen and sophomores are required to attend the weekly seminar without credit.

Junior and senior students are required to prepare and present papers upon assigned engineering topics at the weekly seminar period.

13. Machine Elements. 2 Q. Winter and spring. 6 cr. Prerequisites Mechanical Engineering 8, Civil Engineering 5, 6. Mr. Challender.

The application of the laws of mechanics and strength of materials to the design of machine elements and fastenings, systems of power transmission, journals, and simple machines. Lect. 1; lab. 2.

15. Mechanical Engineering. 1 Q. Autumn. 2 cr. Taken with Mechanical Engineering 17. Fee \$2. Mr. Therkelsen.

Calibration of instruments; calorimetry; indicator practice; fuel and lubricant tests; determination of power and mechanical efficiency of engines. Lab. 2.

15a. Mechanical Laboratory. 1 Q. Winter. 2 cr. Taken with Mechanical Engineering 7. Fee \$2. Mr. Therkelsen.

Calibration of instruments; indicator practice; determination of power and mechanical efficiency of engines. Lab. 2.

17. Steam Engines and Boilers. 1 Q. Autumn. 4 cr. Mr. Therkelsen.

Types of boilers; boiler construction; properties of steam; boiler

rating; boiler settings; combustion of fuels; feed waters; boiler accessories; types of steam engines; multi-expansion engines; condensing; Corliss, poppet valve and uni-flow engines; steam turbines. Lect. 4.

18. **Thermodynamics.** 2 Q. Winter and spring. 8 cr. Prerequisites Mechanical Engineering 17, Physics 1. Mr. Therkelsen.

Properties of gasses, saturated and superheated vapors and mixtures; theoretical and actual engine cycles; flow of liquids through nozzles; throttling processes; application to study of actual engine economics. Lect. 4.

20. **Mechanical Laboratory.** 2 Q. Winter and spring. 4 cr. Prerequisite Mechanical Engineering 15. Fee \$2. Mr. Therkelsen.

Exercises in valve setting; tests of injectors, pumps and engines; thermal and mechanical efficiency tests of gasoline and oil engines. Lab. 2.

21. **Machine Work.** 1 Q. Spring. 2 cr. Fee \$2; deposit \$2. Mr. Homann.

Machine work on lathe, drill press, planer and shaper. Lab. 2.

22. **Gas Power Engineering.** 1 Q. Autumn. 4 cr. Mr. Therkelsen.

Gas engine cycles; fuel mixtures; details of construction; performance of gas motors; design practice in stationary and automobile motors; gas producers and other gas machinery. Lect. 4.

22a. **Gas Power.** 1 Q. 4 cr. Prerequisites Mechanical Engineering 7 or 18. Fee \$2. Mr. Therkelsen.

A brief discussion of the internal combustion engine cycles; followed by study of commercial types of engines and auxiliaries. Methods of testing and current practice in rating internal combustion engines. Laboratory tests of several types. Lect. 3; lab. 1.

23. **Machine Design.** 3 Q. Autumn, winter and spring. 9 cr. Prerequisites Mechanical Engineering 13, 18. Mr. Challender.

The application of principles of preceding courses to the design of complete machines. Assigned problems on machine tools, steam engines, gas engines and steam turbines. Lect. 1; lab. 2.

24. **Heating and Ventilation.** 1 Q. Spring. 2 cr. Prerequisite Mechanical Engineering 7 or 17. Mr. Therkelsen.

Calculation of heat losses from buildings. Radiation requirements for steam, vapor and hot water systems. Furnace systems.

Ventilation with calculations for specific systems. Specifications and estimates of costs. Lect. 2.

25. **Industrial Organization and Management.** 1 Q. Spring. 3 cr. Mr. Norris.

Economics of factory location; staff and departmental organization; production planning and control; inspection systems; cost systems; modern wage systems; employment and labor problems; profit-sharing plans; co-operative-management systems. Lect. 3.

26. **Mechanical Engineering of Power Plants.** 1 Q. Winter. 4 cr. Prerequisite Mechanical Engineering 7 or 18. Mr. Therkelsen.

A study of modern mechanical equipment of steam and gas power plants; costs and economics; selection of types and sizes; arrangements of plants; piping systems; fuel and ash handling; principles underlying design of complete plants; specifications.

26a. **Engineering of Power Plants.** 1 Q. Autumn. 3 cr. Prerequisite Mechanical Engineering 7. Mr. Therkelsen.

A modification of course 26 with special emphasis on equipment for electric power plants. Lect. 3.

27. **Machine Tool Work.** 2 Q. Autumn and winter. 6 cr. Prerequisite Mechanical Engineering 21. Fee \$2; deposit \$2. Mr. Hermann.

Work on lathe, planer, shaper, milling machine, grinder; manufacture of small tools, fitting of parts. Lab. 2.

28. **Mechanical Laboratory.** 1 Q. Autumn. 2 cr. Prerequisites Mechanical Engineering 15, 18. Fee \$2. Mr. Therkelsen.

Efficiency tests of steam and gas power plant machinery; refrigeration, compressed air and heating and ventilating equipment. Lab. 2.

30. **Thesis.** 3 Q. Autumn, winter and spring. 6 cr.

Before graduation, the student is required to present an accepted thesis involving an investigation of some problem related to mechanical engineering. Work will be done under the supervision of the head of the department, but the student will devise his own methods.

31. **Manufacturing Methods and Machinery.** 1 Q. Autumn. 3 cr. Mr. Norris.

The basic materials of engineering; production of steels; non-ferrous alloys; founding; forging methods and machinery; hot and

cold press work; extrusion; machining; machine tools; prevention of corrosion. Lect. 3.

32. **Automobile Practice.** 1 Q. Spring. 3 cr. Fee \$2. Mr. Homann.

Engines; carburetors; clutches and transmissions; axle types; ignition; starting and lighting systems. Lect. 1; lab. 2.

ENGINEERING DRAWING

1. **Mechanical Drawing.** 1 Q. Autumn. 3 cr. Mr. Ludwig.

Use of instruments; lettering; principles of orthographic projection; arrangement of view; drawings of machine parts; dimensioning; titles, sections. Lab. 3.

2. **Mechanical Drawing.** 1 Q. Winter. 3 cr. Mr. Ludwig.

Projections; intersections and developments; triangulation; pictorial representation. Lab. 3.

3. **Engineering Drawing.** 1 Q. Spring. 3 cr. Mr. Ludwig.

Commercial drafting, practice in different branches of engineering; symbols and conventions; assembly views; detailing; patent drawing; tracing and blue printing. Lab. 3.

4. **Topographical Mapping.** 1 Q. Winter. 3 cr. Prerequisites Civil Engineering 1, 2. Fee \$2; deposit \$1. Mr. Grant.

Map lettering and study of conventional signs for topographic maps. Plotting topographic map from stadia field notes. Use of planimeter. Map reading. Lect. 1; lab. 2.

5. **Graphic Presentation of Statistics.** 1 Q. Spring. 3 cr. Mr. Ludwig.

Lettering; charts and diagrams; presentation of statistics by charts, graphs, and pictorial methods. Lab. 2.

College of Applied Science

The departments comprised in the College of Applied Science have a two-fold duty to perform.

(1) They give instruction and training in the fundamental sciences as applied in agriculture, engineering, and home economics. A large and important part of the students' work in these major divisions of the institution is given in the science departments.

(2) They also offer several courses of instruction in which the main object is to prepare specialists in the various branches of the basic sciences. These courses also give an excellent general training and may be taken by those students of agriculture, engineering, and home economics who desire to give more attention to the fundamental and less to the more specialized branches of agriculture, engineering and home economics.

The courses of instruction in the College of Applied Science, each leading to the degree of Bachelor of Science, are as follows: 1, Applied Science; 2, Botany and Bacteriology; 3, Bio-Chemistry; 4, Entomology and Zoology.

Recognizing that beginning students will be benefited by an opportunity to spend at least one year in the institution before committing themselves to a line of study to be followed, the work in the freshman year has been made alike in courses 2, 3, and 4.

COURSE IN APPLIED SCIENCE

FRESHMAN YEAR

	Autumn	Winter	Spring
*English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
French (French 1) or Spanish (Span. 20)	4	4	4
Elementary Analysis (Math. 16) or Engineering Mathematics (Math. 1, 2, 3)	4-5	4-5	4-5
Physical Education (Phy Ed. 1) or Military Science (Mil. Sci. 1)	1	1	1
Home Living (H. E. 29)	1½	½	
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
European History (Hist. 1)	3	3	3
Physical Education (Phy. Ed. 2) or Military Science (Mil. Sci. 2)	1	1	1

Option I

Science option from groups tabulated below select.....	5-6	5-6	5-6
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AUTUMN

Zoology 1
Chemistry 9
Chemistry 5

WINTER

Zoology 3
Botany 1
Chemistry 9
Geology 1
Physics 14

SPRING

Entomology 4
Botany 2
Chemistry 9
Chemistry 8
Physics 14

Electives	6	6	6
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Option II

Engineering Physics (Phys. 1, 2)	5	5	5
Engineering Mathematics (Math. 4, 5, 6)	5	5	5

JUNIOR YEAR

Nineteenth Century Literature (Eng. 10)	3	3	3
Psychology (Ed. 1)	3		
Educational Psychology (Ed. 4)		3	
Development of Vocational Education (Ed. 2)			3
American History (Hist. 5)	3	3	3
Science or Mathematics	5	5	5
Elective	4	4	4

SENIOR YEAR

Contemporary Literature (Eng. 14)	3	3	3
Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Science or Mathematics	7	7	7

COURSE IN BIO-CHEMISTRY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	6
Elementary Analysis (Math. 16)	4	4	4
General Zoology (Zool. 1)	4		
General Botany (Bot. 1)		5	
Seminar (Chem. 22)	1	1	1
Free Hand Drawing (Art 1)			3
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Qualitative Analysis (Chem. 2)	5		
Quantitative Analysis (Chem. 3)		5	5
General Physics (Phys. 14)		5	5
General Bacteriology (Bact. 12)	5		
Sanitary Bacteriology (Bact. 13)		3	
Microbiology (Bact. 14)			5
Seminar (Chem. 20)	1	1	
Elective	4 to 5		
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Quantitative Analysis (Chem. 4)	4		4
Physical Chemistry (Chem. 19)		5	5
Organic Chemistry (Chem. 9)	5	5	5
Seminar (Chem. 20)	1	1	1
Electives	4-5	4-5	4-5

SENIOR YEAR

Advanced English Composition (Eng. 3)	2	2	2
Water Analysis (Chem. 18)			4
Electro Chemistry (Chem. 23)	5		
Seminar (Chem. 20)	1	1	1
Fuel and Oil Analysis (Chem. 17)		3	
Electives	8-10	10-12	9-11

COURSE IN BOTANY AND BACTERIOLOGY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
Freehand Drawing (Art 1)			3
General Chemistry (Chem. 1, 1a, 1b)	4	4	6
Elementary Analysis (Math. 16)	4	4	4
General Zoology (Zool. 1)	4		
General Botany (Bot. 1)		5	
Professional Lectures (Zool. 18)	1		
Professional Lectures (Bot. 9)			1
Seminar (Chem. 22)		1	
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Plant Morphology and Histology (Bot. 7)	5		
Systematic Botany (Bot. 2)			5
Human Physiology (Zool. 3)		6	
General Bacteriology (Bact. 12)	5		
Sanitary Bacteriology (Bact. 13)		3	
Microbiology (Bact. 14)			5
General Physics (Phys. 14)		5	5
Seminar (Bot. 10)	1	1	1
Elective	3-4		
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Advanced English Composition (Eng. 3)	2	2	2
Organic Chemistry (Chem. 9)	5	5	5
Geology (Geol. 1)		4	
Economic Entomology (Ento. 4)			3
Plant Pathology (Bot. 4)		6	
Plant Physiology (Bot. 3)			6
Seminar (Bot. 10)	1	1	1
Elective	8-10		

SENIOR YEAR

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Psychology (Ed. 1)	3		
Educational Psychology (Ed. 4)		3	
Embryology (Zool. 8)		5	
Seminar (Bot. 10)	1	1	1
Thesis (Bot. 11)	5	5	5
Organic Evolution (Zool. 9)			4
Mycology (Bot. 5)			5
Elective	4-5	3-5	

COURSE IN ENTOMOLOGY AND ZOOLOGY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
Freehand Drawing (Art 1)			3
General Chemistry (Chem. 1, 1a, 1b)	4	4	6
Elementary Analysis (Math. 16)	4	4	4
General Zoology (Zool. 1)	4		
General Botany (Bot. 1)		5	
Professional Lectures (Zool. 18)	1		
Professional Lectures (Bot. 9)			1
Seminar (Chem. 22)		1	
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Agricultural Organic Chemistry (Chem. 5)	6		
General Bacteriology (Bact. 12)	5		
Human Physiology (Zool. 3)		6	
Economic Entomology (Ento. 4)			3
General Physics (Phys. 14)		5	5
Systematic Botany (Bot. 2)			5
Principles of Plant Production (Hort. 1)		3	
Field Crops (Agron. 1)	3		
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Advanced English Composition (Eng. 3)	2	2	2
General and Systematic Entomology (Ento. 5)	4		
Systematic Entomology (Ento. 16)		4	
Advanced Economic Entomology (Ento. 6)			4
Invertebrate Zoology (Zool. 17)	4		
Organic Evolution (Zool. 9)			4
Embryology (Zool. 8)		5	
Electives	7	7	8

SENIOR YEAR

Economics (Econ. 3)	3	3	
Sociology (Soc. 4)			3
Psychology (Ed. 1)	3		
Advanced Entomology (Ento. 7)	2	2	2
Thesis (Ento. 10)	4	4	4
Elective	6	8	8

Courses of Instruction

BOTANY AND BACTERIOLOGY

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

The four-years course leading to a degree in botany and bacteriology has two major purposes aside from its disciplinary value. First, to train men for professional careers in botany, plant pathology, agricultural bacteriology and related subjects; second to prepare students for the study of medicine in other institutions. With a judicious selection of electives this is a very good pre-medical course.

In addition to the regular laboratory courses required, a number of the best students get opportunity of working in the laboratories of the experiment station, where they can become familiar with the methods used in research work.

1. **General Botany.** 1 Q. Winter. 5 cr. Fee \$2; deposit \$2. Mr. Swingle, Mr. Jennison.

A brief study of the lower forms of plant life followed by a detailed study of the structure, physiology, and classification of seed plants, especially those of economic importance. Lect. 3; lab. 2.

2. **Systematic Botany.** 1 Q. Spring. 5 cr. Prerequisite one course in elementary Botany. Fee \$3. Mr. Swingle, Mr. Jennison.

Principles and methods used in classification, especially those that apply to seed plants. Lectures, demonstrations, field and laboratory work to familiarize the student with Montana flora, including weeds that have been introduced from other regions. Lect. 2; lab. 3.

3. **Plant Physiology.** 1 Q. Spring. 6 cr. Prerequisites Botany 1 or 6, Physics 1a, Chemistry 5. Fee \$3; deposit \$3. Mr. Jennison.

Nutrition, growth, reproduction and movement in plants especially the higher forms. Lect. 3; lab. 3.

4. **Plant Pathology.** 1 Q. Winter. 6 cr. Prerequisites Botany 1 or 6, Bacteriology 12. Fee \$3. Mr. Jennison.

Plant disease, including the relations of host and parasites, methods of control and the nature of diseases not caused by parasites. Lect. 3; lab. 3.

5. **Mycology.** 1 Q. Spring. 5 cr. Prerequisite Botany 1. Fee \$3. Mr. Jennison.

A comparative study of the structure, physiology and classification of fungi. Lect. 2; lab. 3.

7. **Morphology and Histology.** 1 Q. Autumn. 5 cr. Prerequisite Botany 1. Fee \$4; deposit \$2. Mr. Swingle, Mr. Jennison.

A study of the form and structure of plants, especially those below the seed plants. Lect. 2; lab. 3.

9. **Professional Lectures.** 1 Q. Winter. 1 cr. Mr. Swingle.

A course of lectures required of freshmen in science, designed to give the student an insight into the development, purpose and requirements of the professions of botany and bacteriology.

10. **Seminar.** 3 Q. Autumn, winter and spring. 3 cr. Mr. Jennison.

Abstracts and reviews of journal articles, books, etc. Lect. 1.

11. **Thesis.** Credits variable. Fee \$1; deposit \$4. Mr. Swingle, Mr. Jennison.

Open to seniors in the botany and bacteriology course, and to others who have had sufficient preparation.

12. **General Bacteriology.** 1 Q. Autumn. 6 cr. Prerequisites Chemistry 1, one course in Botany or Zoology. Fee \$4; deposit \$3. Mr. Swingle, Mr. Jennison.

Structure, physiology and classification of bacteria, their growth in nutriment media and methods of bacteriology technique. Relation of bacteria to agriculture, to human and animal pathology, to the arts and industries. Lect. 3; lab. 3.

13. **Sanitary Bacteriology.** 1 Q. Winter. 3 cr. Prerequisite Bacteriology 12 or 16. Mr. Swingle.

Treating of infectious diseases. Sources and modes of infection for self protection and the protection of others. Lect. 3.

14. **Microbiology of Waters and Foods.** 1 Q. Spring. 5 cr. Prerequisite Bacteriology 12. Fee \$4; deposit \$4. Mr. Swingle, Mr. Jennison.

A study of micro-organisms in relation to the sanitary qualities of waters and foods. Foods will be studied on even years and waters on odd years. Lect. 2; lab. 3.

16. **Agricultural Bacteriology.** 1 Q. Autumn. 4 cr. Prere-

quisites Chemistry 1, one course in Botany or Zoology. Fee \$4; deposit \$2. Mr. Swingle.

Fundamental principles of Bacteriology, followed by the application of this subject to soils, dairying, silage, sanitation, etc. Lect. 2; lab. 2.

CHEMISTRY

PROFESSOR, W. M. COBLEIGH. ASSISTANT PROFESSORS, E. J. QUINN, R. C. SHERWOOD. INSTRUCTOR, L. C. HUMPHREY. ASSISTANT, A. P. STARK. Special Lecturers, E. BURKE, Chief Chemist of Experiment Station, Agricultural Chemistry; M. J. BLISH, Research Chemist, Experiment Station, Protein Chemistry; W. H. ANDREWS, Chief Chemist, Three Forks Portland Cement Company, Clays and Cement Making Materials.

The application of chemistry to the various phases of agriculture, to home economics, to engineering and to many modern industries make this science an important one in a technical school.

The college of engineering offers a four-years course in chemical engineering and a four-years course in industrial chemistry. For details regarding these courses reference should be made to the schedules of courses under the college of engineering.

The division of applied science offers a four-years course in biochemistry. This course gives the students an excellent foundation in fundamental courses of both chemistry and biology. The course prepares students for positions in state and municipal food laboratories, water purification plants, experiment station laboratories and for other positions where a knowledge of both chemistry and biology is important.

1, 1a, 1b. **General Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 12 or 14 credits. Fee \$5; deposit \$3. Mr. Cobleigh, Mr. Quinn, Mr. Humphrey, Mr. Stark and assistants.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds, and elementary qualitative analysis. Lect. 2; lab. 2.

This class is taught in sections:

Section 1. For students who present high school units in chemistry for entrance.

Section 2. For students who have not had high school chemistry.

2. **Qualitative Analysis.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Quinn.

The course is presented from the standpoint of modern theories of chemistry. Lect. 3; lab. 2.

3. **Quantitative Analysis.** 2 Q. Winter and spring. 10 cr. Prerequisite Chemistry 2. Fee \$4; deposit \$4. Mr. Quinn.

Theory and technique of the methods of analytical chemistry and chemical calculations. Lect. 2; lab. 3.

4. **Quantitative Analysis.** 3Q. Autumn, winter and spring. Continuous. 12 or 15 credits. Prerequisite Chemistry 3. Fee \$4; deposit \$4.

A continuation of Chemistry 3. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 2. Lect. 2; lab. 3.

5. **Agricultural Organic Chemistry.** 1 Q. Autumn. 6 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4. Mr. Sherwood.

Compounds of the aliphatic and aromatic series and organic materials of interest to students of agriculture and home economics. Lect. 4; lab. 2.

7. **Agricultural Chemistry.** 1 Q. Winter. 6 cr. Prerequisite Chemistry 1; Fee \$6; deposit \$4. Mr. Quinn.

Composition and reaction of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of feeding stuffs and of dairy products and problems of farm sanitation. Lect. 4; lab. 2.

8. **Food Chemistry.** 1 Q. Spring. 6 cr. Prerequisite Chemistry 5. Fee \$4; deposit \$4. Mr. Sherwood.

Composition of foods, food production and preservation, food legislation and inspection. Lect. 4; lab. 2.

9. **Organic Chemistry.** 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisite Chemistry 1, 2. Fee \$4; deposit \$4. Mr. Sherwood.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

11. **Physiological Chemistry.** 1 Q. Winter. 5 cr. Prerequisite Chemistry 5. Fee \$4; deposit \$4. Mr. Sherwood.

Functions of fats, carbohydrates, protein, and salts in nutrition,

together with a study of the chemistry of digestion and metabolism. Lect. 3; lab. 2.

12. Engineering Chemistry. 2 Q. Autumn and spring. 2 and 4 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel and copper. Qualitative and approximate quantitative examinations of the materials listed above as an aid in studying their chemical properties. Lect. 2; lab. 1, or lect. 2; lab. 2.

14. Industrial Chemistry. 3 Q. Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 2, 3, 9. Fee \$4; deposit \$4. Mr. Cobleigh.

The application of chemistry to the industries, including operations common to many chemical industries, such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. The laboratory work in the spring quarter is taught from the viewpoint of chemical engineering. Lect. 3; lab. 2.

17. Fuel and Oil Analysis. 1 Q. Winter or spring. 3 cr. Prerequisite Chemistry 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Production and analysis of solid, liquid, and gaseous fuel, illuminating gas and lubricating oils. Lect. 1; lab. 2.

18. Water Analysis. 1 Q. Winter or spring. 4 cr. Prerequisites Chemistry 1, 3. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewage and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

19. Physical Chemistry. 2 Q. Winter and spring. 10 cr. Prerequisites Chemistry 3, Mathematics 5 or 16. Fee \$4; deposit \$4. Mr. _____.

Theoretical chemistry, including stoichiometry, radio-activity, the electron theory, the gas laws, kinetic theory of gases, liquids, solids, colloids, osmotic pressure, theory of solution and the phase rule. Lect. 3; lab. 2.

20. Seminar. 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Sherwood.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals and present them at weekly

meetings of the students and department instructors, where the topics are discussed. Lect. 1.

21. **Thesis.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Cobeligh, Mr. Quinn, Mr. Sherwood.

Students in the chemistry course may, in the senior year, prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab. 2.

22. **Seminar.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh, Mr. Quinn, Mr. Sherwood.

Serves the purpose of a so-called orientation course designed to give the freshman in chemistry and chemical engineering an appreciation of the field of chemistry in practical affairs, and to give him a more adequate outlook on the training required by professional chemists.

23. **Electro Chemistry.** 1 Q. Autumn. 5 cr. Prerequisite Chemistry 19. Fee \$2; deposit \$2.

Including the following topics:

Electrical conductance, equilibrium, hydrolysis, electromotive force, electrolysis, polarization, electro analysis, electro plating, electric furnaces, applied electro chemistry.

40. **Soil Chemistry.** 1 Q. Spring. 1 cr. Prerequisites Chemistry 5 or 9 and 3. Mr. Burke.

Soil forming rocks, rock weathering, classification of soils, elements essential to plant growth, soil analysis, interpretation of soil analysis. Origin, classification and toxicity of alkali salts. Lect. 1.

41. **Chemistry of Proteins.** 1 Q. Spring. 1 cr. Prerequisite Chemistry 9. Mr. Blish.

Occurrence, origin and chemical constitution of proteins. General and physical properties of proteins and quantitative methods of estimating the units of the protein molecule. Application of the physical and chemical properties of proteins to biology and nutrition. Lect. 1.

ENTOMOLOGY AND ZOOLOGY

PROFESSOR, R. A. COOLEY. ASSISTANT PROFESSOR, M. H. SPAULDING.

The courses in this department are primarily designed to give training in the zoological branches as they are applied in general agri-

culture and home economics. They form a basis for an understanding of the various phases of the development of life and the problems of evolution. They throw light on the problems of social science and are well designed for purposes of general education.

The department is equipped with the necessary microscopes, microtomes, photographic apparatus and dark rooms, and miscellaneous equipment. The various animal groups are well represented in the collections. In the museum room are about five hundred skins of mammals and birds, while among the study materials is an unusually full series of marine and fresh water invertebrates.

The insect collections are especially large and useful. Many thousands of pinned specimens are arranged in the cabinets and these, together with the microscopical slides and alcoholic materials, constitute one of the best insect collections in the west.

1. General Zoology. 1 Q. Autumn. 4 cr. Fee \$3. Mr. Spaulding.

Survey of invertebrate and vertebrate forms, including morphology, bionomics, development, classification, and economic or popular interest. Lect. 2; lab. 2.

2. Vertebrate Zoology. 1 Q. Spring. 6 cr. Prerequisite Zoology 1. Fee \$3. Mr. Spaulding.

Vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Elective to all students. Lect. 3; lab. 3.

3. Human Physiology and Anatomy. 1 Q. Winter. 6 cr. Prerequisite Zoology 1 or 15. Fee \$3. Mr. Spaulding.

Lectures and demonstrations presenting the main principles of animal physiology, the human body being used as the type, augmented by laboratory work in mammalian anatomy. Lect. 3; lab. 3.

4. Economic Entomology. 1 Q. Spring. 3 cr. Prerequisite Zoology 1 or 15. Fee \$2. Mr. Cooley.

Following a brief survey of the anatomy, metamorphosis and classification of insects, consideration is given to important insect pests and the principles and means of control. Lect. 2; lab. 1.

5. General and Systematic Entomology. 1 Q. Autumn. 4 cr. Prerequisite Entomology 4. Fee \$2. Mr. Cooley.

A continuation of Entomology 4, giving detailed consideration to classification into orders and families; study of types of the orders.

6. **Advanced Economic Entomology.** 1 Q. Winter. 4 cr. Prerequisite Entomology 4. Fee \$2. Mr. Cooley.

Insect pests and insect control. Lect. 2; lab. 3.

7. **Advanced Entomology.** 3 Q. Autumn, winter and spring. Continuous. 6 to 10 cr. Prerequisites Entomology 4, 5, 6. Fee \$2. Mr. Cooley.

Individual instruction to fit the students' needs, including systematic, economic, biological and library work.

8. **Embryology.** 1 Q. Winter. 5 cr. Prerequisite Zoology 1. Fee \$3. Mr. Spaulding.

Formation and growth of tissues and organs in the vertebrate body, based chiefly on the study of the chick, but including a consideration of the developments in the mammalia. Lect. 2; lab. 3.

9. **Organic Evolution.** 1 Q. Spring. 4 cr. Prerequisite Zoology 1. Mr. Spaulding.

The facts and theories of evolution and genetics; including variation, natural and artificial selection, heredity and inheritance, etc. Lect. 4.

10. **Thesis.** Credits variable, not to exceed 5. Fee \$2 to \$10. Mr. Cooley or Mr. Spaulding.

Seniors in this department and seniors from other courses, who have had sufficient previous training, may elect this course.

11. **Economic Zoology.** 1 Q. Autumn. 3 cr. Prerequisite Zoology 1 or 2. Mr. Spaulding.

Discussion of vertebrates of economic importance and devoted chiefly to mammals and birds. Lect. 3.

15. **General Biology.** 1 Q. Spring. 6 cr. Fee \$3. Mr. Spaulding.

The fundamental principles of plant and animal life, planned particularly for the needs of students in home economics. Lect. 3; lab. 3.

16. **Systematic Entomology.** 1 Q. Winter. 4 cr. Fee \$2. Prerequisites Entomology 4, 5. Mr. Cooley.

A continuation of Entomology 5, dealing with the fundamental principles and problems concerned in the classification of insects and a detailed study for practice of a selected group. Lect. 2; lab. 2.

17. **Invertebrate Zoology.** 1Q. Autumn. 4 cr. Prerequisite Zoology 1. Fee \$3. Mr. Spaulding.

An advanced course, intended primarily for science students, presenting in more detail the structure, habits, taxonomy and importance of the invertebrate phyla, special stress being placed upon the arthropoda exclusive of the insects. Lect. 2; lab. 2.

18. **Professional Lectures.** 1 Q. Autumn. 1 cr. Mr. Cooley.

A course of lectures required of freshmen in science, designed to give the student an insight into the development, purpose, and requirements of the professions of zoology and entomology.

College of Household and Industrial Arts

The courses offered in the College of Household and Industrial Arts are Applied Art, Home Economics and Secretarial Work.

The purpose of each of the courses is indicated by its title. The industrial application of the work is emphasized in each course. The applied art course and secretarial work are open to both men and women. Several subjects taught in departments not represented in the College of Household and Industrial Arts are open to election by students on consent of their adviser.

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COURSE IN APPLIED ART

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
French (French 1) or			
Spanish (Span. 20)	4	4	4
Drawing (Art 1)	3		3
General Botany (Bot. 1)		5	
Design (Art 7)	3	3	4
Painting (Art 2)		2	2
Perspective (Art 15)	2		
Home Living (H. E. 29)	1½	½	
Physical Education (Phys. Ed. 1)	1	1	1
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
French (French 2) or			
Spanish (Span. 21)	4	4	4
History of Art (Art 6)	3	3	3
Historic Ornament (Art 7a)	2	2	2
Drawing (Art 1a)	3		
Painting (Art 2a)	3		3
Human Physiology and Anatomy (Zool. 3)		6	
Composition (Art. 16)			2
Physical Education (Phys. Ed. 2)	1	1	1

JUNIOR YEAR

Economics (Econ. 3)	3	3	
Psychology (Ed. 1)	3		
Contemporary Literature (Eng. 14)	3	3	3
Painting (Art 2b)		2	2
Advanced Design (Art 7b)	2	2	2
Drawing (Art 1b)	3		3
Medieval History (Hist. 2)	3	3	3
Household Physics (Phys. 9)		5	
Elective			4-5

SENIOR YEAR

Sociology (Soc. 4)			3
Modern Drama (Eng. 6)	2	2	2
Advanced Design (Art 7c)	3	3	3
Special Problem (Art 19)	3	3	3
Elective	8-10	8-10	5-7

COURSE IN HOME ECONOMICS

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
General Biology (Zool. 15)			6
Design (Art 7)	3	2	
Textiles (H. E. 13)		2	2
Clothing (H. E. 11)	3	3	
Foods (H. E. 1a)	3	3	
Dressmaking (H. E. 12)			3
Physical Education (P. E. 1)	1	1	1
Home Living (H. E. 29)	1½	½	
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Organic Chemistry (Chem. 5)	6		
Food Chemistry (Chem. 8)			6
Foods (H. E. 2)			4
Physiology (Zool. 3)		6	
Household Physics (Phys. 9)		5	
Food Preservation (H. E. 1b)	3		
Millinery (H. E. 17)			3
House Planning (A. E. 13)			2
General Bacteriology (Bact. 12)	5		
Sanitary Bacteriology (Bact. 13)		3	
Physical Education (P. E. 2)	1	1	1

JUNIOR YEAR

General Psychology (Ed. 1)	3		
Modern Drama (Eng. 6)	2	2	2
House Furnishing (Art 8b)		5	
Costume Design (Art 8)	5		
Physiological Chemistry (Chem. 11)		5	
Food Economy (H. E. 4)			4
Medieval History (Hist. 2) or			
American History (Hist. 5)	3	3	3
Economics (Econ. 3)	3	3	
Elective	2-3		9

SENIOR YEAR

Contemporary Literature (Eng. 14)	3	3	3
Home Problems (H. E. 10)		4	
Dietetics (H. E. 6)	6		
Advanced Needlework (H. E. 13)			3
Embroidery Design (Art. 8)			2
Sociology (Soc. 4)			3
Electives	9	11	7

COURSE IN HOME ECONOMICS FOR TEACHERS

JUNIOR YEAR

	Autumn	Winter	Spring
Special Methods (H. E. Ed. 2)		3	3
Psychology (Ed. 1)	3		
Theory and Practice (Ed. 5)	3		
Development of Vocational Education (Ed. 2)			3
Costume Design (Art. 8)	5		
Advanced Dressmaking (H. E. 14)			4
Physiological Chemistry (Chem. 11)		5	
Food Economics (H. E. 4)			4
House Furnishing (Art 8b)		5	
Home Nursing (H. E. 9)		2	
Economics (Econ. 3)	3	3	
Elective	4		4

SENIOR YEAR

Dietetics (H. E. 6)	6		
Household Administration (H. E. 7)		8	
Educational Psychology (Ed. 4)		3	
Sociology (Soc. 4)			3
*Teaching Practice (H. E. Ed. 1)			
*Home Problems (H. E. 10)			
English or History	3	3	3
Electives	7-9	4	10-12

*Teaching Practice three credits and Home Problems four credits are required during one quarter of the senior year.

COURSE IN SECRETARIAL WORK

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
Modern Language	4	4	4
European History (Hist. 1)	3	3	3
Shorthand (Sec. 1)	2	2	2
Typewriting (Sec. 3)	1	1	1
Physical Education (Phys. Ed. 1) ..or			
Military Science (Mil. Sci. 1).....	1	1	1
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Modern History (Hist. 7)	3	3	3
Principles of Accounting (Sec. 9)	3	3	3
Modern Language	4	4	4
Commercial Law (Sec. 8)	3	3	
Business Correspondence (Sec. 5)			3
Shorthand (Sec. 2)	1	1	1
Typewriting (Sec. 4)	1	1	1
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

JUNIOR YEAR

Nineteenth Century Literature (Eng. 10)	3	3	3
Economics (Econ. 3)	3	3	
Elementary Analysis (Math. 16)	4	4	
Theory of Investments (Math. 15)			3
Industrial History (Hist. 10)	3	3	3
Office Practice (Sec. 6)			3
Advanced Accounting (Sec. 10)	3	3	3
Marketing (Econ. 8)			3

SENIOR YEAR

Contemporary Literature (Eng. 14)	3	3	3
American History (Hist. 5)	3	3	3
Salesmanship (Sec. 16)	3	3	
Principles of Business (Sec. 14)		3	3
Sociology (Soc. 4)			3
Psychology (Ed. 1)	3		
Electives	6	6	6

TWO YEARS' COURSE IN SECRETARIAL WORK

	Autumn	Winter	Spring
FRESHMAN YEAR			
English Composition (Eng. 1, 1a, 1b)	3	3	3
General Chemistry (Chem. 1, 1a, 1b)	4	4	4
Modern Language	4	4	4
European History (Hist. 1)	3	3	3
Shorthand (Sec. 1)	2	2	2
Typewriting (Sec. 2)	1	1	1
Physical Education (Phys. Ed. 1) or			
Military Science (Mil. Sci. 1)	1	1	1
College Education (Ed. 10)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 2, 2a, 2b)	2	2	2
Modern History (Hist. 7)	3	3	3
Principles of Accounting (Sec. 9)	3	3	3
Modern Language	4	4	4
Commercial Law (Sec. 8)	3	3	
Business Correspondence (Sec. 5)			3
Shorthand (Sec. 2)	1	1	1
Typewriting (Sec. 4)	1	1	1
Physical Education (Phys. Ed. 2) or			
Military Science (Mil. Sci. 2)	1	1	1

Courses of Instruction

APPLIED ART

PROFESSOR, LANA BALDWIN. INSTRUCTOR, SALLIE GILLESPIE. ASSISTANTS, HELEN LUND, CECILE JUMP.

The object of this course is to prepare students for studio work as designers, craftsmen, or decorators, and also to prepare them to teach drawing and handicraft in elementary, grammar and high schools. The course includes the study of line, form, color, historic ornament, principles of design and composition and technical methods in applied design. It insures a broad foundation of art culture and skill which will enable students to make practical use of their training. Exceptional facilities are offered for the study of design and composition and the course is strengthened by the many phases of related work.

1. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$.50. Miss Gillespie.

Drawing from the cast in charcoal pencil, or pen and ink. Lab. 2 to 4.

1a. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Continuous. 3 to 9 cr. Fee \$.50. Miss Gillespie.

Continuation of Art 1. Lab. 2 to 4.

1b. **Freehand Drawing.** 2 Q. Autumn and spring. 6 cr. Fee \$.50. Miss Gillespie.

Continuation of Art 1a. Lab. 3.

1c. **Freehand Drawing.** 3 Q. Autumn, winter and spring. Fee \$.50. Miss Gillespie.

Drawing from costume model and sketching from nature. 3 to 9 cr. Lab. 2 to 3. Elective course for seniors in art.

2. **Painting.** 2 Q. Winter and spring. Continuous. 4 cr. Prerequisite Art 1. Fee \$.50. Miss Baldwin.

Water colors, oils and tempera. Work from nature and still life. Lab. 2.

2a. **Painting.** 2 Q. Autumn and spring. 6 cr. Lab. 3. Fee \$.50. Miss Baldwin.

Continuation of Art 2.

2b. **Painting.** 2 Q. Winter and spring. Fee \$.50. Miss Baldwin. 4 cr.

Painting from costume model and landscape in tempera, water color and oil. Elective course for seniors in art. Lab. 2.

3. **Architectural Drawing.** 3 Q. Autumn, winter and spring. 6 cr. Fee \$.50. Lab. 2. Miss Baldwin and Miss Gillespie.

First quarter drawing from casts in charcoal. Second quarter drawing from casts in pen and ink, and wash. Third quarter, sketching.

3a. **Architectural Drawing.** Autumn 3 cr. Prerequisite Art 3. Fee \$.50. Miss Baldwin.

Continuation of Art 3. Sketching work executed in wash and color. Lab. 3.

4. **Drawing from Nature.** 1 Q. Autumn, or winter, or spring. 2 cr. Fee \$.50. Miss Lund.

Pencil, pen and ink, wash and color. Intended especially for students in biology. Lab. 2.

6. **History of Art.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Miss Baldwin.

Intended especially for students of design. Historic ornament and the classic styles as exemplified in painting, sculpture and architecture. Lect. 3.

7. **Design.** 3 Q. Autumn, winter and spring. 9 cr. Fee \$.50. Miss Baldwin.

Applied design and use of water color. Students submit original designs. Lect. 1; lab. 2. Lab. 2. Lect. 2; lab. 2.

7a. **Historic Ornament** 3 Q Autumn, winter and spring Continuous. 6 cr. Prerequisite Art 7. Fee \$.50. Mrs. Jump.

Historic ornament with analysis of historic examples of design. Original problems executed in black and white and in color. Lab. 2.

7b. **Advanced Design.** 3 Q. Autumn, winter and spring. Continuous 6 cr. Miss Baldwin.

Continuation of 7c.

Original design for commercial purposes executed to meet the requirements and conditions of reproduction. Lab. 2.

7c. Advanced Design. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Fee \$.50. Miss Baldwin.

8. Costume Design. 1 Q. Autumn. 5 cr. Fee \$3. Mrs. Jump.
History of costumes; study of line, form and color in relation to costume.

8a. Embroidery Design. 1 Q. Spring. 2 cr. Fee \$.50. Miss Baldwin.

Theory of color and design; original designs for embroidery. Lab. 2.

8b. House Furnishing. 1 Q. Winter. 5 cr. Fee \$.50. Miss Baldwin.

Color, line and form as applied to house furnishings. Lect 2; lab. 3.

8c. Decorative Periods. 1 Q. Winter. 3 cr. Prerequisite Art 8b. Fee \$.50. Miss Baldwin.

Advanced work in interior decoration. Decorative styles and their adaptation to modern uses. Original designs for interiors executed in color. Lect. 1; lab. 2.

10. Decoration of China. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee \$2; deposit \$4. Miss Lund.

China is fired in the studio. Lab. 2.

11. Leather. 1. Q. Autumn, or winter or spring. 2 cr. Prerequisite Art 7. Fee \$3. Miss Baldwin.

Tooling, modeling and embossing; also use of dyes and stains for leather. Lab. 2.

12. Jewelry. 3 Q. Autumn, winter and spring. Continuous. 6 to 12 cr. Fee \$3. Miss Baldwin.

Making of simple and unique jewelry in gold, silver and in copper. Saw-piercing, enameling, repousse and the setting of semi-precious stones. Lab. 2 to 4.

13. Metal. 1 Q. Winter. 2 to 4 cr. Fee \$3. Miss Baldwin.

Work in copper, brass and silver. Raising, saw-piercing, etching, hard and soft soldering and riveting. Lab. 2 to 4.

14. **Basketry.** 1 Q. Winter. 2 cr. Fee \$3. Miss Baldwin.

Making baskets of reed and raffia and other suitable materials. Dyes and dyeing baskets. Use of native materials in original work in basketry. Lab. 2.

15. **Perspective.** 1 Q. Autumn. 2 cr. Fee \$.50. Miss Gillespie.

Principles of angular and parallel view perspective taught by means of freehand sketches and drawings. Work in pencil, pen and ink, wash and color. Lect. 1; lab. 1.

16. **Composition.** 1 Q. Spring. 2 cr. Fee \$.50. Miss Gillespie.

Art structure as a means of expression. Original compositions in light and dark line and color. Lect. 1; lab. 1.

17. **Practice work in Teaching.** 1 Q. Autumn or winter, or spring. 2 cr. Miss Baldwin.

Teaching, drawing, painting, design and handicrafts.

18a. **Methods.** 1 Q. Winter. 3 cr. Fee \$.50. Miss Baldwin.

Methods of teaching, drawing, painting and design. Lessons, plans and materials. Lect. 2; lab. 1.

18b. **Methods.** 1 Q. Spring. 3 cr. Fee \$.50. Miss Baldwin.

Methods of teaching the handicrafts; metal, jewelry, leather, basketry, wood block painting and stenciling. Lesson plans. Materials and equipment. Lect. 2; lab. 1.

19. **Special Problems.** 3 Q. Autumn, winter and spring. 9 cr. Fee \$1 to \$5. Miss Baldwin.

HOME ECONOMICS

PROFESSOR, PAULINE FISK. ASSISTANT PROFESSORS, EDITH FRANKS, EMMA P. GARRISON. INSTRUCTORS, RUBY HOLMSTROM, RUTH SWEAT.

The field for young women trained in home economics is wide. They may become teachers in either foods or clothing, extension workers and home demonstration agents; textile or clothing experts in the commercial world, or institutional managers (i. e., hospital dietitians, dormitory, cafeteria, or lunch room managers in schools, state institutions, or the commercial field. Even if the young woman is not fitting herself for earning her living and wants merely a liberal and useful education, home economics has much to offer.

1a. Foods. 2 Q. Autumn and winter. 6 cr. Fee \$2.50. Miss Sweat.

A course in food principles, food composition, and cookery processes. Students who have had sufficient work in cookery in high schools are scheduled in a special section. Those with insufficient training will be given more intensive work. Lect. 1; lab. 2.

1b. Food Preservation. 1 Q. Autumn. 3 cr. Prerequisites, Chemistry 1, Home Economics 1a. Fee \$2.50. Miss Sweat.

A course in canning and preserving. Lect. 1; lab. 2.

1c. Foods. 1 Q. Spring. 5 cr. Every other year alternating with home economics 11a. Open to applied art students. Fee \$2.50. Miss Sweat.

A course for general study of food principles, cookery processes, fundamentals of meal planning and serving. Lect. 2; lab. 3.

2. Food Studies. 1 Q. Spring. 4 cr. Prerequisites, Home Economics, Chemistry 5, Zoology 3. Fee \$3. Miss Sweat.

A course for the comparative study of the science underlying the selection and preparation of foods. Lect. 2; lab. 2.

4. Food Economics. 1 Q. Spring. 4 cr. Open to juniors. Fee \$4. Miss Sweat.

Planning family meals relative to the nutrition and cost. Serving of various types of meals. Some work in fancy cookery. Lect. 2; lab. 2.

5. Seminar. 1 Q. Spring. 3 cr. Prerequisites Home Economics 6, Chemistry 11, Bacteriology 12, Physics 9. Miss Fisk and departmental faculty.

Students will read and abstract articles from current magazines and books. Two papers will be required.

6. Dietetics. 1 Q. Autumn. 6 cr. Prerequisites Home Economics 2, Chemistry 11, Bacteriology 12. Fee \$4. Miss Fisk.

A course in human nutrition and metabolism, the relation of food to health and disease, the construction and preparation of dietaries. Lect. 3; lab. 3.

7. Household Administration. 1 Q. Winter or spring. 6 cr. Open to seniors. Fee \$.50. Miss Fisk.

A study of family incomes, budgets, household accounts, marketing and housekeeping. During this course groups of students spend a stated time doing practice house work.

8. **Extension Course.** 1 Q. Winter. 3 cr. Miss Turley, Miss Fisk.

A history of the development of extension work, also special methods and outlines for field work. Students will do some field work under supervision of the extension staff. Lect. 2; lab. 2.

9. **Home Nursing.** 1 Q. Winter. 2 cr. Required for juniors in Home Economics teachers training course. Mrs. McCray.

A course in caring for the sick in the home. Lect. 1; lab. 2.

10. **Home Problems.** 1 Q. Winter or spring. 4 or 6 cr. Open to seniors. Fee \$.50 to \$.6. Miss Fisk.

Original or suggested investigation in food work or along economic lines pertaining to present living conditions.

11. **Clothing.** 2 Q. Autumn and winter. 6 cr. Fee \$2. Miss Garrison.

Hand and machine sewing applied to useful articles and garments. Drafting simple patterns, use and alteration of drafted and commercial patterns. Subject matter for elementary and secondary schools is emphasized. Lect. 1; lab. 2.

Where necessary to strengthen the technique in sewing, summer projects will be assigned between freshman and sophomore years.

Students who have had sufficient work in sewing in high school are scheduled in a special section. Those with insufficient work will be given more intensive work.

11a. **Clothing.** 1 Q. Spring. Every other year alternating with Home Economics 1c. 5 cr. Fee \$1.50. Miss Holmstrom.

A course arranged to meet the needs of applied art students. It includes the adaptation of patterns, and selection and making of garments. Lect. 2; lab. 3.

12. **Dress Making.** 1 Q. Spring. 3 cr. Prerequisite Home Economics 11. Fee \$1. Miss Garrison.

Use of drafted and commercial patterns as a basis for elementary dress design, and construction. Lect. 1; lab. 2.

13. **Textiles.** 2 Q. Winter and spring. 4 cr. Fee \$2. Miss Garrison.

A study of the history, production, identification and testing of textiles, developing judgment in selection of fabrics for the house and for clothing. Lect. 1; lab. 1.

14. **Advanced Dress Making.** 1 Q. Spring. 4 cr. Prerequisites

Home Economics 11, 12, 13, Art 8. Fee \$1. Miss Holmstrom.

Advanced problems in pattern designing applied to silk and wool garments. Lect. 1; lab. 3.

16. **Draping and Designing.** 1 Q. Autumn. 3 cr. Prerequisite Home Economics 14. Fee \$1. Miss Holmstrom.

This course aims to develop originality in designing garments and greater skill in the handling of materials through the construction of afternoon and evening gowns, on the dress form. Lect. 1; lab. 2.

17. **Millinery.** 1 Q. Spring. 3 cr. Fee \$2. Miss Garrison.

Renovating and remodeling summer materials and hats, problems in construction, covering and trimming. Students are urged to bring from home old hats and trimmings for use in this course. Lect 1; lab. 2.

17a. **Millinery.** 1 Q. Autumn. 3 cr. Prerequisite Home Economics 17. Fee \$2. Miss Garrison.

Construction of hat frames of various types; plain covering, trimming, renovation and use of old materials. Lect. 1; lab. 2.

18. **Advanced Needlework.** 1 Q. Spring. 3 cr. Fee \$1. Miss Holmstrom.

A course for the application of designs made in Art 8a to clothing and household textiles. Art 8a is required with this course. Lect. 1; lab. 2.

19. **Therapeutic Cookery.** 1 Q. Winter. 2 cr. Prerequisite Home Economics 6. Fee \$1. Miss Fisk.

A study of feed requirement and preparation of dietaries of abnormal cases. Lect. 1; lab. 1.

20 **Experimental Cookery.** 1 Q. 3 cr. Open to seniors. Fee \$2. Miss Fisk.

This course offers an opportunity for qualitative experimental work in cookery. Lect. 1; lab. 2.

2. **Child Care and Training.** 1 Q. 2 cr. Miss Fisk.

A study of the mental and physical development of the child and those influences which promote normal growth and health. Lect. 2.

23. **Dietetics.** 1 Q. Winter. 3 cr. Prerequisite Home Economics 6. Fee \$4. Miss Fisk.

Special attention is given to the study of recent advances in the science of nutrition and to training for specialized work in the field of nutrition. Lect. 2; lab. 1.

24. **Survey of Institutional Organization.** 1 Q. Autumn. 3 cr. Open to juniors and seniors. Miss Maxwell.

A consideration of the different types of institutional work, the training, qualifications, and experience of institutional workers; and the general principle of management, including service problems.

25. **Institutional Cookery.** 1 Q. Winter. 4 cr. Prerequisite Home Economics 24. Miss Maxwell.

A review of cookery principles and their application limited to quantity work with dormitory kitchens as laboratories.

26. **Institutional Buying.** 1 Q. —————2 cr. Prerequisite Home Economics. Miss Maxwell.

Marketing of food supplies and their storage. Buying of equipment for food departments and dormitories. Also laundry and linen problems.

27. **Institutional Experience.** 1 Q. Spring. 4 to 7 cr. Prerequisite Home Economics 24, 25, 26. Miss Maxwell.

Open only to seniors. Limited section. Actual experience in Hamilton Hall and in the food department of the Men's Dining Hall in various kinds of service other than cookery. Each student will carry the responsibility of the management for a given time.

28. **Children's Clothing.** 1 Q. Winter or spring. 4 cr. Prerequisites Home Economics 11, 12, 13. Open to juniors and seniors. Fee \$1.50. Miss Holmstrom.

This course consists of copying designs and developing patterns from plain commercial ones, alternating patterns to fit the individual child, and drafting underwear; also making garments of the different types from those of the infant to the eight year old child. Lect. 2; lab. 2.

20. **Home Living.** 2 Q. Autumn and winter. Required of all home economics freshmen. 2 cr. iGiven by different members of the faculty. Lect. 2; lab. 1.

Care of person, clothing, room; banking, group living, study methods.

HOME ECONOMICS EDUCATION

ASSISTANT PROFESSORS, EMMA GARRISON, EDITH FRANKS.

1. **Teaching Practice in Home Economics.** 1 Q. Autumn, winter or spring. 3 cr. Miss Franks.

Preparation of lesson plans and outlines with an opportunity to observe and teach classes.

2. **Special Methods in Home Economics.** 2 Q. Winter and spring. Miss Garrison and Miss Franks.

Theory and practice of teaching domestic science and domestic art. Study is made of courses in various types of institutions. Courses of study are planned for graded schools, high schools and colleges. Lesson plans are given special attention. Lect. 3; lab. 1.

SECRETARIAL STUDIES

PROFESSOR, R. O. WILSON. ASSISTANT PROFESSOR, W. B. HOLMES,
INSTRUCTOR, DELLA YOUNG.

The course in secretarial work requires fifteen units of preparation and extends through four years. The technical work is planned to be directly applicable to business, and broad enough to serve as a basis for such positions as private secretary, office manager, etc.

The course includes a thorough grounding in English, and at least one modern language—French or Spanish, together with work in science, history, and social science. Women may elect some work in home economics. The technical work includes business procedure, office management and practice, business law, principles of accounting, principles underlying business activities, shorthand and typewriting.

The two- years secretarial course is intended for those who cannot take the time to complete a four-years course. The completion of a high school course or its equivalent is required for entrance.

1. **Shorthand.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Young.

Fundamental principles of shorthand practice in word building, phrasing and dictation. Lect. 4.

2. **Shorthand.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Young.

Practice in writing letters, legal papers, testimony, and miscellaneous matter. Students who take this course will also take Secretarial 4. Lect. 3.

3. **Typewriting.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Fee \$1. Miss Young.

Use and care of typewriters. Exercises for the development of

proper wrist and finger movements, and for the mastery of the keyboard. Practice in letter writing and the use of carbon. Lab. 4.

4. **Typewriting.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Fee \$1. Miss Young.

Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; practice in the use of the mimeograph. Students who take this course will also take Secretarial 2. Lab. 3.

5. **Business English and Correspondence.** 1 Q. Spring. 3 cr. Mr. Wilson.

A practical course in business correspondence. Lect. 3.

6. **Office Practice.** 1 Q. Spring. 3 cr. Miss Young.

Practice with various kinds of office appliances and equipment, such as adding machines, addressing machines, filing, etc. Lect. 1; lab. 1.

8. **Commercial Law.** 2 Q. Autumn and winter. 6 cr. Mr. Holmes.

Students will be required to familiarize themselves with the rights and liabilities of parties to common business transactions, as contracts, sales, deeds, mortgages; and with the drawing up and validity of commercial paper and contracts. Text and cases. Lect. 3.

9. **Principles of Accounting.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Holmes.

Principles underlying accounting in general. Laboratory exercises. Lect. 1; lab. 2.

10. **Advanced Accounting.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Holmes.

The science of accounting will be taught in this course from both the theoretical and practical standpoints. Corporation accounting will be introduced and cost accounting will be developed. The course will also include a study of different accounting systems with the object of fitting the students to plan or improve accounting systems for various types of businesses.

14. **Principles of Business.** 2 Q. Winter and spring. 6 cr. Mr. Holmes.

A treatment of business as a science, as a group of activities governed by laws and rules, whose relation to the other sciences is intimate. Consideration of scientific methods of financing and manage-

ment as they may be applied to business. Analysis of financial statements. Lect. 3.

16. **Salesmanship and Business Efficiency.** 2 Q. Autumn and winter. 6 cr. Mr. Holmes.

A study of the fundamental principles and philosophy of human leadership, mental and business efficiency, and the science and art of salesmanship. Lect. 3.

Courses In General

ECONOMICS

PROFESSOR J. M. HAMILTON.

3. **Economics.** 2 Q. Autumn and winter. 6 cr.

Principles of economic science. Study of such questions as trusts, labor and capital, money and banking, transportation, and taxation. Lect. 3.

4. **Sociology.** 1 Q. Spring. 3 cr.

Introduction of sociology. Attention given to the problems of marriage and divorce, immigration, race questions, charities and corrections, pauperism and crime. Lect. 3.

6. **Agricultural Economics.** 1 Q. Winter. 3 cr. Prerequisite Economics 3.

Agricultural economic problems; land problems; agricultural labor; rural credit; co-operative associations; markets. Lect. 3.

7. **Rural Sociology.** 1 Q. Spring. 3 cr. Prerequisite Sociology 4.

Rural social problems; the farm home; rural health; country church; rural schools; roads, recreations, etc. Lect. 3.

8. **Marketing Farm Products.** 1 Q. Autumn or spring. 3 cr.

Marketing functions, methods of sales, middle men, storage, transportation, market exchanges, future trading, principles of co-operative marketing, stock and non-stock organizations, patronage dividends, co-operative marketing of grain, livestock, vegetables, and fruit. Lect. 3.

10. **Irrigation Institutions and Economics.** 1 Q. Spring. 3 cr.

History and development of irrigation in western United States; riparian rights; doctrine of appropriation; legal duty of water; adjudication of water rights; Carey Land Act; National Reclamation Service; Montana irrigation laws. Lect. 3.

EDUCATION AND PSYCHOLOGY

PROFESSOR J. M. O'GORMAN.

1. Psychology. 1 Q. Autumn. 3 cr. Prerequisite junior standing or consent of the instructor.

This course presents a general view of the field of modern psychology. An insight is given into the methods, materials of psychological investigation; emphasis being placed upon the fundamental or dynamic point of view.

2. Development of Vocational Education. 1 Q. Spring. 3 cr.

A brief survey of industrial education prior to 1800, some of the most significant developments during the nineteenth century, and the present status and need, including a brief study of vocational guidance.

3. Itinerant Teachers' Training Work.

All students who meet the Smith-Hughes requirements and are teaching in the field may, through correspondence work, receive credit for courses in education. At present courses are being given to students through correspondence in psychology, educational psychology and theory and practice of teaching.

4. Educational Psychology. 1 Q. Winter. 3 cr. Prerequisite, Psychology 1 or its equivalent.

This will include some genetic and experimental psychology. Intensive study will be made of the native equipment of human beings, and the psychology of learning. A brief survey of the more elementary statistical means of measuring the educational product will be made.

5. Theory and Practice of Teaching. 1 Q. Autumn or spring. 3 cr.

A study of the aims of education in the democracy, the fundamentals and technique of class room instruction and management, and the use of scales in tests for measuring the educational product.

6. Principles of Educational Philosophy. 1 Q. Winter. 2 cr.

This course is given mainly for teachers in Bozeman and the immediate vicinity.

The course consists of a critical examination of the more fundamental approaches to the educational field and attempts to harmonize some of the prevailing conflicts in the teaching field.

10. College Education. 1 Q. Autumn. No cr.

A general course outlining the problems of college life with a discussion of fundamentals usually considered important by successful people. The course will be given under the direction of the president and the deans of men and women.

ENGLISH

PROFESSOR, W. F. BREWER. ASSISTANT PROFESSORS, J. Q. OWEN, JESSIE DONALDSON. INSTRUCTORS, GERTRUDE SIBLEY, ANNA LINDBLOM.

1. **English Composition.** 1 Q. Autumn, winter. 3 cr. Mr. Brewer, Miss Donaldson, Miss Lindblom, Miss Sibley.

1a. **English Composition.** 1 Q. Winter, spring. 3 cr. Mr. Brewer, Miss Donaldson, Miss Lindblom, Miss Sibley.

1b. **English Composition.** 1 Q. Spring. 3 cr. Mr. Brewer, Miss Donaldson, Miss Lindblom, Miss Sibley.

Rhetorical principles. Written and oral composition with study of types of prose composition.

2. **Expository Composition.** 1 Q. Autumn, winter. 2 cr. Mr. Owen.

2a. **Expository Composition.** 1 Q. Winter, spring. 2 cr. Mr. Owen.

2b. **Expository Composition.** 1 Q. Spring. 2 cr. Mr. Owen.

English 2, 2a, 2b, required of all sophomores.

Instruction in the handling of units of expository composition from 300 to 600 words. As a basis for the written work, essays adapted to the vocational outlook of the students are assigned for reading each week and discussed orally in the class room. The subjects of the essays are such as will relate the student's idea about his vocation to the various fields of knowledge with which he must come in contact either as student or vocational worker.

3. **Advanced English Composition.** 1 Q. Autumn. 2 cr. Mr. Brewer.

Elective for juniors and seniors.

3a. **Advanced English Composition.** 1 Q. Winter. 2 cr. Mr. Brewer.

3b. **Advanced English Composition.** 1 Q. Spring. 2 cr. Mr. Brewer.

Writing of technical papers especially adapted to the needs of technical students. Will apply in a special field the fundamentals of written and oral composition as given in English 1 and 2. In conducting the course the English department co-operates with the technical departments represented by the students who take the course.

5. **Argumentation and Forms of Public Address.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Mr. Owen.

Principles of argumentation; briefs and debates. Some study of the forms of public address with written and oral practice. Elective.

6. **Modern Drama.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisite English 1. Miss Lindblom.

A course in presentation and in reading of plays.

10. **Nineteenth Century Literature.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Miss Sibley.

Nineteenth century English literature; a study of nineteenth century prose and poetry. Reading of representative selections with particular reference to their political, social and economic setting. Lectures and class room discussions.

With the consent of the instructor this course may be taken in any quarter separately.

14. **Contemporary Literature.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Miss Donaldson.

A reading and discussion course in contemporary English and American novel, poetry, essay and short story.

With the consent of the instructor this course may be taken any quarter separately.

FRENCH AND SPANISH

INSTRUCTORS, C. JUMP, E. G. TRUITT.

1. **French.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Elements of grammar based on Fraser and Squairs' French Grammar, with constant practice in pronunciation, dictation and conversation. Reading of easy texts.

2. **French.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Review of grammar. Typical fiction and dramas of the nineteenth century. Advanced composition and original theme writing. Conversation and dictation.

3. **French.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

Study of classical and modern dramas and novels. Masterpieces of Corneille, Moliere, Racine, Rostand, Hugo and Balzac. Collateral reading and reports.

20. **Spanish.** 3 Q. Autumn, winter and spring. Continuous, 12 cr.

Elements of grammar with conversation and special emphasis on pronunciation. Reading of short stories and easy novels.

21. **Spanish.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

Reading of modern novelists and dramatists. Conversation and composition.

GEOLOGY

ASSISTANT PROFESSOR, E. J. QUINN.

1. **General Geology.** 1 Q. Winter or spring. 4 cr. Prerequisite Chemistry 1.

Application of the science of agriculture and engineering. Rocks and rock forming minerals and their classification. A trip to Morrison cave, an interesting formation lying about fifty miles west of Bozeman, will be included in the field work. Lect. 4.

2. **Mineralogy.** 1 Q. Autumn or spring. 4 cr. Prerequisite Chemistry 1. Fee \$4; deposit \$4.

Crystallography and the classification and identification of the more important minerals and rocks. Lect. 2; lab. 2.

GERMAN

Instruction in German is suspended under the order of the State Council of Defense.

1. **Elementary German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Grammar and essay readings, with practice in speaking and writ-

ing German. Open to college students who have not had high school or preparatory German.

2. **Intermediate German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Prerequisite German 1.

Modern prose, narrative and dramatic. Grammar review and elementary syntax, written and oral exercises.

3. **Advanced Freshman German.** 3 Q. Autumn, winter and spring. Continuous. 12 cr.

Classical and modern writers. Selected work of Schiller, Heine, Freytag, Sudermann and others. Conversation, composition and syntax. Open to freshmen who have had two years of high school German.

4. **Classics of the Eighteenth Century.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Masterpieces of Lessing, Goethe and Schiller.

5. **Modern German Dramatists.** 3 Q. Autumn, winter and spring. Continuous. 6 cr.

Selected dramas of Grillparzer, Hebbel, Sudermann, Hauptmann, and others. A rapid reading course.

6. **Scientific German.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Prerequisites German 1, 2.

For students specializing in science. Rapid reading of scientific prose.

HISTORY

ASSISTANT PROFESSOR, HELEN R. BREWER.

1. **European History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

The development of modern Europe. Use of the library with lectures on historical methods.

2. **Medieval History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Alternates with History 5.

First two quarters a text book is used; last two quarters on the Italian Renaissance, topical references to the library and pictures.

5. **American History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 1. Alternates with Medieval History 2.

United States history covering the period of constitutional development. Use of the library is required, and the student is expected to spend about one-fourth time in the preparation of a paper.

7. **Modern History.** 3 Q. Autumn, winter and spring. Continuous. 9 cr.

Current events, a review of the political and industrial development of the last few decades.

10. **Industrial History.** 3 Q. Autumn, winter and spring. Continuous. Prerequisite History 1.

Outlines of United States industrial history. Each quarter the student will write a paper on some special line of industry, which he either reads upon or personally investigates.

MATHEMATICS

PROFESSOR, W. D. TALLMAN. INSTRUCTORS, FRIEDA BULL, J. B. BALLARD, MRS. M. TALLMAN.

1. **Engineering Mathematics.** 1 Q. Autumn or winter. 5 cr. Mr. Tallman, Miss Bull, Mr. Ballard.

The first three-fifths of the quarter's work is given to plane trigonometry. The remainder of the quarter is devoted to college algebra. The work of this quarter and about half of the following quarter covers a review of radicals and quadratic equations, progressions, binomical theorem, theory of limits, undermined coefficients, infinite series, permutations and combinations, probability, and an introduction to the theory of equations.

2. **Engineering Mathematics.** 1 Q. Winter or spring. 5 cr. Miss Bull, Mr. Ballard.

Half of the the quarter is devoted to the continuation of the algebra started in the first quarter and the remainder of the time is devoted to analytical geometry.

3. **Engineering Mathematics.** 1 Q. Autumn or spring. 5 cr. Mr. Tallman, Miss Bull, Mr. Ballard.

Continuation of analytical geometry and work in calculus covering "Woods & Bailey" course in mathematics, Vol. I, with the exception of the last three chapters.

4. **Engineering Mathematics.** 1 Q. Autumn or winter. 4 cr. Mr. Tallman.

"Woods & Bailey" Vol. I is completed and the subjects of integral

calculus, solid analytical geometry, elements of differential equations are given substantially as in Vol. II in this course and in course 5.

5a. **Engineering Mathematics.** 1 Q. Winter or spring. 4 cr. Mr. Tallman.

Continuation of course 5.

5b. **Engineering Mathematics.** Spring and autumn. 4 cr. Mr. Tallman.

6. **Astronomy.** 1 Q. Spring. 3 cr. Prerequisites Physics 1, Mathematics 4, 5. Mr. Tallman.

Spherical astronomy with an introduction to some celestial mechanics.

8. **Trigonometry and Logarithms.** 1 Q. Autumn; spring. 4 cr. Miss Bull.

9. **College Algebra.** 1 Q. Spring. 5 cr.

Covers the ground given to algebra in Mathematics 1, 2. Miss Bull.

10. **Differential Equations.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Ordinary and partial differential equations with geometrical and mechanical applications.

11. **Partial Differential Equations of Mathematics-Physics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Course based on Weber's "Die Partielle Differential Gleichungender Mathematischen Physic," and Byerley's "Spherical Harmonics."

12. **Theory of Least Squares and Probable Error.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 5. Mr. Tallman.

13. **Statistics.** 3 Q. Autumn, winter and spring. Continuous. 9 cr. Prerequisite Mathematics 4. Mr. Tallman.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation and application of the principles developed to problems in biology, sociology and economics.

15. **Mathematical Theory of Investments.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 2, 9 or 16. Mr. Tallman.

16. **Elementary Analysis.** 3 Q. Autumn, winter and spring. 12 cr. Mr. Tallman, Miss Bull.

A brief course in mathematics covering the fundamental principles of college algebra, trigonometry, analytical geometry and calculus designed to meet the needs of scientific students who cannot find the time to take the more extended course in these subjects found in Engineering Mathematics 1, 2, 3, 4, 5.

Courses 3, 4, 5, will be repeated in other quarters than scheduled if demanded by six or more students. During the fourth quarter such of the above courses will be offered only when sufficient numbers of students demand them. Should there be a demand during the fourth quarter a 12 credit course covering 2 and 3, or one covering 4 and 5 may be offered.

MILITARY SCIENCE

PROFESSOR, MAJOR J. P. BUBB. INSTRUCTORS, L. A. ELLSWORTH, J. P. YOUNGMAN.

1. Military Science. 3 Q. Autumn, winter and spring. Continuous. 3 cr.

I. ELEMENTARY SUBJECTS OF MILITARY TRAINING.

1. Theoretical instruction:

- (a) Principles of the organization and the administration of "A" Company.
- (b) Military hygiene, first aid, and sanitation.
- (c) Military courtesies and customs of the service.
- (d) Interior guard duty.

2. Practical work.

II. PHYSICAL TRAINING.

1. Theoretical instruction.

2. Practical work.

III. INFANTRY DRILL.

1. Theoretical instruction.

- (a) Close and extended order.
- (b) Ceremonies.

2. Practical work.

- (a) Close and extended order drills.
- (b) Ceremonies.

IV. INFANTRY WEAPONS AND EQUIPMENT.

- 1 Theoretical instruction.
 - (a) The infantry pack.
 - (b) The rifle.
 - (c) The bayonet.
2. Practical work.

V. SIGNAL COMMUNICATION.

VI. MINOR TACTICS.

2. Military Science. 3 Q. Autumn, winter and spring. Continuous. 3 cr.

I. MILITARY SKETCH AND MAP READING.

- 1 Theoretical instruction.
 - (a) Map reading.
 - (b) Military sketching.

II. PHYSICAL TRAINING.

1. Theoretical instruction.
2. Practical work.
 - (a) Setting-up exercises.
 - (b) Mass games and mass athletics.
 - (c) College athletics.

III. INFANTRY DRILL.

1. Theoretical instruction.
 - (a) Fundamentals of leadership.
 - (b) Close and extended order.
 - (c) Combat.
2. Practical work.
 - (a) Exercises and demonstrations.
 - (b) Participation with first year students.
 - (c) Practical exercises with unit.

IV. INFANTRY WEAPONS.

1. Theoretical instruction.
 - (a) The rifle.
 - (b) The automatic rifle
 - (c) The machine gun.
2. Practical work.
 - (a) The rifle.

- (b) The automatic rifle.
- (c) The machine gun.

V. MINOR TACTICS.

- 1. Theoretical instruction.
 - (a) Covering detachments.
- 2. Practical work.
 - (a) Covering detachments.

No additional subjects will be taught in this year, it being evident that all available time should be fully occupied with thorough instruction in the subjects prescribed. In case additional time becomes available at any institution it will be utilized to give fuller treatment to the subjects in the prescribed course and for conducting refresher courses in the subjects covered in the basic first year.

3. **Military Science.** 3 Q. Autumn, winter and spring. Continuous. 5 cr.

I. FIELD ENGINEERING.

- 1. Theoretical instruction.
 - (a) Elements of field engineering.
- 2. Practical work.
 - (a) Military field engineering problems.

II. PHYSICAL TRAINING.

- 1. Theoretical instruction.
- 2. Practical work.
 - (a) Setting-up exercises.
 - (b) Mass games and mass athletics.
 - (c) College athletics.

III. INFANTRY DRILL.

- 1. Theoretical instruction.
 - (a) School of the battalion in close order.
 - (b) School of the regiment in close order.
- 2. Practical work.
 - (a) and (b) Drills and exercises.

IV. INFANTRY WEAPONS.

- 1. Theoretical instruction.
 - (a) The pistol.
 - (b) Hand and rifle grenades.

- (c) Trench mortars and one-pounder gun.
- 2. Practical work.
 - (a) The pistol.
 - (b) Hand and rifle grenades.
 - (c) Mortars and one-pounder gun.

V. MINOR TACTICS.

- 1. Theoretical instruction.
 - (a) Offensive and defensive conduct of small units.
- 2. Practical work.
 - (a) Offensive and defensive conduct of small units.
- 4. Military Science. 3 Q. Autumn, winter and spring. Continuous. 5 cr.

I. MILITARY HISTORY AND POLICY OF THE UNITED STATES.

- 1. Theoretical instruction.
 - (a) Important campaigns and battles in the history of the United States and the tactical deductions therefrom.
 - (b) History of the military policy of the United States, including the period of the World War.
 - (c) Economic history of the United States and the relations existing in our economic conditions and those of Europe, Asia and South America and its relation to military history.

II. PHYSICAL TRAINING.

- 1. Theoretical instruction.
- 2. Practical work.
 - (a) Setting-up exercises.
 - (b) Mass games and mass athletics.
 - (c) College athletics.

III. INFANTRY DRILL.

- 1. Practical work.
 - (a) Drills and tactical exercises.

IV. MILITARY LAW AND RULES OF LAND WARFARE.

- 1. Theoretical instruction.
 - (a) The articles of war.
 - (b) Courts martial.

- (c) Evidence.
- (d) Rules of land warfare.
- 2. Practical work.
 - (a), (b), and (c) Moot Courts.

V. MINOR TACTICS.

- 1. Theoretical instruction.
- 2. Practical work.

VI. ADMINISTRATION.

- 1. Practical work.
 - (a) Company paper work.
 - (b) Company administration.

VII. MUSKETRY.

- 1. Theoretical instruction.
 - (a) Principles of musketry.
 - 2. Practical work.
 - (a) Musketry problems.
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MUSIC

PROFESSOR, —————. INSTRUCTORS, JUNE HARTMAN, L. HOWARD, MRS. W. G. NASH, MRS. C.B. ECKLES, MRS. B. C. CURRIER.

The department of music offers to students of the college and others opportunity to pursue the study of the main branches of music under competent instructors.

Tuition is payable to the secretary of the college in advance. No reduction will be made for absence from lessons. Teachers will make up hours they fail to give according to schedule.

The department is closed on the college holidays. Lessons falling on these days will not be made up.

No student is permitted to take part in any public performance without the consent of the director.

Students of this department will be granted certificates, if desired, testifying to quality and amount of work done.

Recitals are given from time to time by the instructors and advanced students to which admission is free.

Music to a total of not more than six credits may be counted toward a degree in those courses which allow free electives. To

those regular students who elect music the college will furnish free one thirty-minute lesson a week during any two years of the sophomore, junior or senior years, or any quarter of these three years; and the work may be elected in either vocal or instrumental music.

Students who enroll in two musical organizations may be given one-half credit per quarter in each, but in no case may a student exceed one credit per quarter for all musical organizations in which he is enrolled.

PIANO

The instruction in piano will comply with the special needs of each individual student, and the courses of music given them to study will be taken from the works of such standard composers as are recognized by the leading musicians and musical institutions of the world. Specimen programs illustrating the class of music taught will be sent to anyone interested by the department. Elementary harmony is given with the piano lessons as an aid to the analysis of each piece, which is so necessary in memorizing.

Ensemble and Sight Reading

In this branch of instruction lie indispensable elements of musical knowledge and culture. Ensemble playing develops the students' ability in sight reading, and enables them to acquire an acquaintance with the masterwork of symphonic and orchestral literature, which is ordinarily inaccessible to the music student.

Theory

Courses in harmony and musical history will be given if the demand justifies.

VOICE

The training and development of the voice proceeds hand in hand with the acquisition of musical tastes and intelligence. Methods are adapted to individual needs. The voice is trained for correct placement, artistic tone, flexibility and agility. The possibilities of varied tone qualities for expressional purposes are emphasized and illustrated. The study of vocal technique includes the subjects of breathing, resonance, tone color, correct attack, sustained tones, scales, arpeggios, legato, staccato, embellishments. Various exercises are used. Attention is given to elegance of diction.

The cultivation of musical taste and artistic interpretation is effected by study of the best modern and classic art songs, operatic arias, and oratorio selections. The art of singing is a complex one as so much depends on the intellectual and emotional status of the singer. Hence the singer should aim to acquire general culture, appreciation of the beautiful in the world of thought and emotion as well as in the realm of sound.

VIOLIN

The aim of the department is the acquisition of thorough technique and the study of the works of the best masters. Ensemble playing forms an important part of the course.

MUSIC TUITION

Piano With Mrs. Nash.

One half-hour lesson per week for one quarter.....	\$18.00
Two half-hour lessons per week for one quarter	33.00
Ensemble playing per quarter	7.00

Piano With Miss Hartman

One half-hour lesson per week for one quarter.....	\$15.00
Two half-hour lessons per week for one quarter.....	27.00

Voice With Mrs. Eckles

One half-hour lesson per week for one quarter.....	\$15.00
Two half-hour lessons per week for one quarter.....	33.00

When students enter late, lessons missed will be deducted at the rate of \$1.00 per lesson.

Piano practice on the college pianos may be arranged for at the following rates:

One hour daily per quarter	\$4.00
Additional hour per quarter	3.00

PHYSICAL EDUCATION FOR WOMEN

DIRECTOR, UNA B. HERRICK (Dean). INSTRUCTOR, LORA MAXWELL.

The aim of the physical education department for women is to develop each woman to her highest economic value as a unit of society, to the end that when she finishes her college course she may carry forth into life a sane, well balanced, logical mind, high moral character, and a strong symmetrical, properly functioning body, capable of assuming and performing cheerfully and well the duties of cultured womanhood.

Lectures are given on personal hygiene; general deportment for women; dress from the standpoint of health and appearance; the physiology of bodily exercise; the useful and practical knowledge of First Aid. The regulation gymnasium suits and shoes will be required.

1. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and strengthen vital functions. The work will consist of Swedish body-building work, floor tactics, fundamental light apparatus work, rhythmic dancing and games, simple First Aid. Lect. 2.

2. **Physical Education.** 3 Q. Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

The work will consist of lectures, recreational games, advanced light apparatus work, corrective gymnastic, folk and aesthetic dancing. First aid. Lect. 2.

3. **Playground.** 3 Q. Autumn, winter and spring. Continuous. 6 cr. Miss Maxwell.

This course will include thorough preparation in theory, methods and practice teaching in physical education. Games, playground work, corrective exercises and folk dancing. Practical experiences gained by the teaching of classes in all grades of the city and public schools and high schools.

PHYSICS

PROFESSOR, F. W. HAM. ASSISTANT PROFESSOR, J. A. KIEFER.

The following courses in physics are designed to meet the needs of (1) those students who are preparing to take up some of the more technical studies in engineering, agriculture, or home economics; (2),

those who expect to become physics or science teachers and, (3), those general science students who wish to acquire some scientific training which is peculiar to the science of physics alone.

1. Engineering Physics. 3 Q. Autumn, winter and spring. Continuous. 9 cr. Mr. Kiefer.

More mathematical than Physics 1a and particularly designed to meet the needs of students in engineering. Students who have not completed the calculus, mathematics 4, are required to take it during the same year that Physics 1 is taken. Lect. 3.

1a. Agricultural Physics. 1 Q. Spring. 6 cr. Prerequisite Mathematics 8 or its equivalent. Fee \$1; deposit \$1. Mr. Ham.

A general course with special emphasis on the fundamental principles of physics important in the different branches of agriculture. Lect. 3; lab. 3.

2. Physical Measurements. 3 Q. Autumn, winter and spring. Continuous. 6 cr. Fee \$1; deposit \$1. Mr. Kiefer.

Laboratory course designed to supplement Physics 1. Lab. 2.

3. Light and Sound. 1 Q. Spring. 3 cr. Prerequisites Physics 1, 2. Mr. Kiefer.

Theory of light in its application to familiar optical phenomena and to optical instruments. The phenomena and laws of sound. Lect. 3.

4. Physical Measurements. 1 Q. Spring. 2 cr. Fee \$1; deposit \$1. Mr. Kiefer.

Laboratory course in light and sound to supplement Physics 3. Lab. 2.

5. Electricity and Magnetism. 2 Q. Autumn and winter. 6 cr. Prerequisites Physics 1, 2, Mathematics 4. Fee \$1; deposit \$1. Mr. Ham.

Methods for the exact measurements of resistance electro-motive force, current, capacity, and the co-efficient of self induction. Calibration of commercial instruments, insulation testing, and magnetic measurements. Lect. 2; lab. 1. Lect. 1; lab. 2.

6d. Pedagogy of Physics. 1 Q. Spring. 4 cr. Prerequisites Physics 1, 2, 3, 4. Mr. Ham.

Methods of teaching, the selection and performance of effective lecture table and laboratory experiments and practice on presenting the topics covering such experiments to elementary and college classes. Lect. 4.

9. **Household Physics.** 1 Q. Spring. 5 cr. Fee \$1; deposit \$1. Mr. Ham.

A general course including the physics of ventilation, the lighting and heating of houses and other physical phenomena of interest to the housekeeper. Lect. 2; lab. 3.

10. **Meteorology.** 1 Q. Spring. 4 cr. Mr. Ham.

Sources and measurements of atmospheric temperature, pressure and circulation of the atmosphere, measurement and movement of moisture, cause and prevention of frost. Part of the course will consist of a study of Montana weather bulletins. Lect. 4.

11. **Electron Theory.** 1 Q. Spring. 3 cr. Prerequisites Mathematics 4, 10 credits of college physics. Mr. Ham.

Graduate course open to undergraduates who can satisfy the prerequisites. Not a survey course but a discussion of recent research work. Lect. 3.

14. **General Physics.** 2 Q. Winter and spring. 8 or 10 cr. Prerequisite Mathematics 16. Fee \$1; deposit \$1. Mr. Ham.

A course for students desiring a general knowledge of physics either in connection with the other sciences or as a matter of general education. The course will consist of a general survey of mechanics, heat, light, electricity and magnetism, and sound and will be less mathematical than the technical courses in physics.

Lecture demonstrations will be numerous and the students will be given an opportunity to test many of the laws for himself in the laboratory. Lect. 3; lab. 2.

16. **Advanced Heat.** Autumn. 4 cr. Prerequisites Physics 1 and 2 or 14. Fee \$1; deposit \$1. Mr. Ham.

A continuation of the study of the laws of heat begun in Course 1. Special attention will be given to methods of heat transmission, thermometry, specific heats and the laws of thermodynamics. Lect. 3; lab. 1.

Secondary Schools

The work under Secondary Schools is confined to the School of Agriculture. This course continues through a period of three years of six months each.

School of Agriculture

The School of Agriculture offers practical instruction to the young men from the farms of Montana who wish to fit themselves for successful farming. These courses offered are intended as a preparation for life rather than for college. The student is brought into actual contact with the problems connected with the farm and learns that agriculture is a profession requiring both skill and knowledge.

Students in this school have the privilege of studying a modern dairy in operation, including types of the best breeds of dairy cattle; a complete poultry plant in operation, containing breeds illustrating especially the best laying strains and market fowls; modern grain and soil laboratories; model farm buildings and barns, with purebred livestock; the experiment station farm; greenhouse and orchards; and the large biological, chemical and physical laboratories, and well-equipped wood and iron shops of the engineering college.

The variety of animals included upon the farm affords ample opportunity to see the various diseases, injuries, etc., encountered in farm animals. In the veterinary building, there is provided a clinic room, where the sick and injured animals are treated, and the student is given the benefits of these demonstrations.

The course extends through three years of six months each and comes in the winter season when the young men can be spared from farm work. For admission to the school, students must have passed the eighth grade or its equivalent, or give satisfactory evidence to the principle of the school that they are capable of carrying on the work. Young men twenty-one years of age or over will be admitted to the course without having completed the eighth grade provided they have had some practical experience on the farm and possess a fair common school education. Those who satisfactorily complete the course will be given certificates.

SCHOOL OF AGRICULTURE

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a)	4	4
Elementary Physics (Phys. b)	5	
Drawing (M. A. k)	4	
Common Diseases (Vet. Sci. a)		4
Animal Types (An. Husb. a and b)	2	2
Farm Shop (Agron. h)		4
Military Science (Mil. Sci. a)	1	1

OPTIONAL

Plant Propagation and Tree Planting (Hort. a)	4	
Irrigation and Drainage (Agron. f)	4	
Industrial Arithmetic (Math. f)		5
Vegetable Gardening and Fruit Culture (Hort. b)		3
Farm Machinery (Agron. e)		3

SECOND YEAR

English Composition (Eng. b)	2	2
Elementary Chemistry (Chem. a)		5
Soils and Crops (Agron. a and b)	6	6
Breed Types (An. Husb. c-d)	2	2
Farm Motors (Agron. g)	3	
Principles of Feeding (An. Husb. e)		2
Farm Dairy (Dairy a)	3	
Dairy Management (Dairy b)		3
Farm Poultry (Poultry a)	4	
Military Science (Mil. Sci. b)	1	1

THIRD YEAR

Composition and Literature (Eng. c)	2	2
Farm Management and Accounts (Agron. d)		4
Plant Diseases (Bot. a)		3
Feeding and Management of Dairy Cattle and Swine (An. Husb. f)	3	
Feeding and Management of Beef Cattle, Sheep and Horses (An. Husb. i) ..		3
Agricultural Economics (Econ. a)	3	
Rural Sociology (Soc. b)		3
Animal Breeding (An. Husb. g)	3	
Insect Pests (Ent. a)	3	
Farm Tractors (Agron. i)	5	
Military Science (Mil. Sci. c)	1	1

OPTIONAL

Dairy Manufactures (Dairy d)		3
Factory Management (Dairy c)		3
Infectious Diseases (Vet. Sci. b)		3
Parliamentary Law (Eng. d)		2

Total credits allowed in first and third years 20 to 22.

Course of Instruction

AGRONOMY

PROFESSOR, P. V. CARDON. ASSISTANT PROFESSORS, E. L. CURRIER, H. E. MURDOCK, H. R. SUMNER.

a. **Crops and Soils.** 1 Q. Autumn. 6 cr. Mr. Sumner.

How plants grow, fundamental features of plant growth, soil as a factor in plant growth; elementary soil studies; soil types, structure, soil water, soil temperature, moisture, conservation, tillage methods, acid and alkali soils; cereal production; practical studies of wheat, barley, oats, corn, and other cereals. Their production on dry and irrigated farms. Grain judging and the market classes of grain. Lect. 3; lab. 3.

b. **Crops and Soils.** 1 Q. Winter. 6 cr. Prerequisite Agronomy a. Mr. Sumner.

A continuation of the studies of Agronomy a. Management and care of meadows and pastures. Hays and hay making forage crops for Montana; the production and handling of alfalfa, clovers, grasses, sorghums, and other forage crops. Lect. 4; lab. 2.

d. **Farm Management and Accounts.** 1 Q. Winter. 4 cr. Mr. Currier.

Fundamental principles involved in the successful organization and management of a farm are considered. Lect. 2; lab. 1.

e. **Farm Machinery.** 1 Q. Winter. 3 cr. Prerequisites Physics b. Mr. Murdock.

Study of the various types of farm machinery. Selection, adjustment and care of farm machinery. Modern farm conveniences, such as telephones, water supply systems, etc. Lect. 2; lab. 1.

f. **Irrigation and Drainage.** 1 Q. Autumn. 4 cr. Mr. Murdock. Methods of irrigating and draining land. Lect. 1; lab. 1.

h. **Farm Shop.** 1 Q. Winter. 4 cr. Mr. Murdock.

Use of hand tools in carpentry; fitting and joining; forge work; use of heat with metals; drill press; repairing harness; machinery. Lect. 1; lab. 3.

i. **Farm Tractors.** 1 Q. Autumn. 5 cr. Mr. Murdock.

Use of tractors on the farm. Overhauling, adjusting and repairing tractors. Operation. Lect. 1; lab. 4.

ANIMAL HUSBANDRY

PROFESSOR, C. N. ARNETT. ASSISTANT PROFESSOR, R. C. MCCHORD,
INSTRUCTOR, O. TRETSVEN.

a. **Animal Types.** 1 Q. Autumn. 2 cr. Fee \$1. Mr. Tretsven.
Market types of cattle and sheep. Lab. 2.

b. **Animal Types.** 1 Q. Winter. 2 cr. Fee \$1. Mr. Tretsven.
Judging of market types of dairy cattle, horses and swine.
Lab. 2.

c. **Breed Types.** 1 Q. Autumn. 2 cr. Fee \$1. Prerequisites
Animal Husbandry a, b. Mr. McChord
Breed types of cattle and sheep. Lect. 1; lab. 1.

d. **Breed Types.** 1 Q. Winter. 2 cr. Prerequisites Animal
Husbandry a, b. Mr. McChord.
Breed types of dairy cattle, horses and swine. Lab. 2.

e. **Principles of Feeding.** 1 Q. Autumn. 2 cr. Fee \$2. Mr.
Tretsven.

A study of the nutrients and their functions, digestion, feeding
standards, compounding rations, feeds and their adaptability.

f. **Feeding and Management of Dairy Cattle and Swine.** 1 Q.
Autumn. 3 cr. Prerequisites Animal Husbandry e. Fee \$2. Mr.
Tretsven.

Feeding and general management of purebred and grade dairy
cattle and swine for production. Mr. Tretsven.

g. **Animal Breeding.** 1 Q. Autumn. 3 cr. Prerequisites Ani-
mal Husbandry c, d. Mr. McChord.

Principles of breeding as directly applied to the farm. Cross
breeding, inbreeding, and line breeding. Lect. 2; lab. 1.

i. **Feeding and Management of Beef Cattle, Sheep and Horses.**
1 Q. Winter. 3 cr. Prerequisites Animal Husbandry e. Fee \$2.
Mr. Tretsven.

Feeding and general management of purebred and grade beef
cattle, sheep and horses, considered for farm and range.

BOTANY AND BACTERIOLOGY

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

a. **Plant Diseases.** 1 Q. Winter. 3 cr. Fee \$1. Mr. Jennison.

A study of the importance, symptoms, and methods of control of the more important diseases of plants. Lect. 2; lab. 1.

CHEMISTRY

PROFESSOR, W. M. COBLEIGH.

a. **Elementary Chemistry.** 1 Q. Winter. 5 cr. Fee \$4; deposit \$4.

Lectures with experimental illustrations, and recitations on general elementary chemistry. Special emphasis will be given to the applications of the science to daily life and to agriculture. Lect. 3; lab. 2.

DAIRY HUSBANDRY

PROFESSOR, G. L. MARTIN.

a. **Farm Dairying.** 1 Q. Autumn. 3 cr. Fee \$2; deposit \$1.

Factors in development and distribution of the dairy industry, importance of clean milk; care and handling of cream, operation of hand separators and preparation for market. Lect. 2; lab. 1.

b. **Dairy Management.** 1 Q. Winter. 3 cr. Fee \$2; deposit \$1.

The factors influencing the composition and properties of milk and its products. Adulterations, fermentations, modifications, and ripening of cream. Manipulation of tests, manufacture of butter, cheese and ice cream and the marketing of dairy products.

c. **Management of Dairy Plants.** 1 Q. Winter. 3 cr. Fee \$2; deposit \$1.

Construction and equipping factories, receiving and handling manufactured products, utilization of by-products. Manipulation of machinery. Testing, scoring and marketing. Dairy records and accounts. Lect. 2; lab. 1.

d. **Dairy Manufactures.** 1 Q. Winter. 3 cr. Fee \$2; deposit \$1.

Factory methods of making butter, cheese and frozen dairy products. Tests for composition, adulteration and standardization. Lect. 2; lab. 1.

ECONOMICS

PROFESSOR, J. M. HAMILTON.

- a. **Agricultural Economics.** 1 Q. Autumn. 3 cr.

A study of such agricultural economic problems as the value and rent of land, farm labor, rural credit, co-operative buying and selling. Lect. 3.

- b. **Rural Sociology.** 1 Q. Winter. 3 cr.

The social problems of the open country, rural health and sanitation, the country church, the rural school, the means of communication and transportation, libraries and recreations. Lect. 3.

ENGLISH

INSTRUCTOR, MRS. B. F. DAVIS.

- a. **English Exercises.** 2 Q. Autumn and winter. 8 cr. Mrs. Davis.

Practice in spelling punctuation, note taking, letter writing and the simple forms of composition. Lect. 4.

- b. **English Composition.** 2 Q. Autumn and winter. 4 cr. Mrs. Davis.

The paragraph and its development; the news item and short news story; business forms; practice in oral and written composition.

- c. **Composition and Literature.** 2 Q. Autumn and winter. 4 cr. Mrs. Davis.

Oral and written exercises in narration, description, exposition, and arrangement; current literature, use of the library.

- d. **Parliamentary Law.** 1 Q. Winter. 2 cr. Mrs. Davis.

The principles of parliamentary law, the conduct of meetings, the organization of a society, the duties of officers, the recording of proceedings. The students will be given drill and actual practice. Lect. 2.

ENTOMOLOGY AND ZOOLOGY

PROFESSOR, R. A. COOLEY.

- a. **Insect Pests.** 1 Q. Winter. 3 cr. Mr. Cooley.

Consideration of the more important insect pests of Montana and the means of their control. Lect. 3.

HORTICULTURE

PROFESSOR, ———. ASSISTANT PROFESSOR, C. C. STARRING.

a. **Plant Propagation and Tree Planting.** 1 Q. Autumn. 4 cr. Fee \$1. Mr. Starring.

Plant propagation with special reference to the methods of multiplying fruit and planting of trees. The latter part of the course deals with simple principles of ornamental planting and ornamental plants, and the growing of trees adapted to Montana conditions. Lect. 4.

b. **Vegetable Gardening and Small Fruit Culture.** 1 Q. Winter. 3 cr. Mr. Starring.

Methods of growing; gathering, storing, and marketing the more important vegetable crops; hot bed construction and management; and the growing of such small fruits as the strawberry, raspberry, blackberry, currants, and gooseberry. Lect. 3.

c. **Fruit Growing.** 1 Q. Autumn. 3 cr. Prerequisite Horticulture a. Mr. Starring.

Selecting sites, planning and planting, cultivation, irrigation, pruning, and general care of the orchard, more especially from the standpoint of the home orchard. Lect. 3.

d. **Home Gardening.** 1 Q. Winter. 3 cr. Mr. Starring.

Elementary course dealing with the principles of plant propagation, vegetable gardening, small fruit culture, and ornamental gardening. Lect. 3.

MATHEMATICS

PROFESSOR, W. D. TALLMAN. INSTRUCTOR, FRIEDA BULL.

b. **Advanced Abgebra.** 1 Q. Autumn. 4 cr. Miss Bull.

Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional, zero) radicals, etc. Lect. 4.

d. **Solid Geometry.** 1 Q. Spring. 4 cr. Prerequisite Mathematics b, c. Mr. Tallman.

This course covers ordinary work in solid geometry with special attention to the geometry of the sphere. Lect. 4.

f. **Industrial Arithmetic.** 1 Q. Autumn. 5 cr. Miss Bull.

Fundamental processes of arithmetic related to home and farm

experience. Mathematical problems connected with the work of the shop and laboratory. Lect. 4.

MECHANIC ARTS

INSTRUCTOR, F. L. GRIFFIN.

k. **Mechanical Drawing.** 1 Q. Autumn. 4 cr.

Elements of lettering; geometrical construction; isometric and orthographic representations; working drawings; farm building construction; bill of material; farm maps. Lab. 2.

MILITARY SCIENCE

PROFESSOR, MAJOR JOHN P. BUBB. INSTRUCTOR, SGT. THEODORE L. BEERS

a. **Military Science.** 2 Q. Autumn and winter. 2 cr.

Refer to military science courses in the college for a description of this work, and the courses that follow.

b. **Military Science.** 2 Q. Autumn and winter. 2 cr.

c. **Military Science.** 2 Q. Autumn and winter. 2 cr.

PHYSICS

PROFESSOR, F. W. HAM. ASSISTANT PROFESSOR, J. A. KIEFER.

a. **Elementary Physics.** 3 Q. Autumn, winter and spring. Continuous. 12 cr. Mr. Kiefer. Fee \$1; deposit \$1.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound, heat, light, electricity and magnetism. Lect. 3; lab. 1.

b. **Elementary Physics.** 1 Q. Autumn. 5 cr. Mr. Ham.

Experimental lectures, recitations, and assigned problems on mechanics, heat, light and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture. Lect. 5.

c. **Elementary Physics.** 2 Q. Autumn and winter. 8 cr. Fee \$1; deposit \$1. Mr. Ham.

POULTRY HUSBANDRY

PROFESSOR, W. F. SCHOPPE.

a. Farm Poultry. 1 Q. Autumn. 4 cr.

Various breeds and their adaptability to farm use. Housing, feeding, incubation and brooding. Judging birds, operating incubators and brooders. Lect. 3; lab. 1.

VETERINARY SCIENCE

PROFESSOR, H. WELCH.

a. Common Diseases of Animals. 1 Q. Winter. 4 cr.

A course for the stock grower, illustrating methods of diagnosis and treatment of the common ailments of domestic animals. First aid treatment of wounds and injuries; a brief course of instruction in obstetrical work and methods of handling cases of different parturition. Each division of the course is illustrated by actual cases as far as possible.

b. Infectious Diseases of Animals. 1 Q. Winter. 3 cr. Pre-requisite Veterinary Science a.

A course dealing with the more important and common infectious diseases of animals. Diagnosis, methods of prevention, quarantine regulations, and disease eradication methods.

Roster

COMMANDANT, CADET OFFICERS AND CADET NON-COMMISSIONED OFFICERS.

COMMANDANT

Bubb, John P.....Major of Infantry and Professor of Military
Science and Tactics

ASSISTANTS

Ellsworth, Lewis A. Sergeant
Youngman, John P. Sergeant

Cadet Officers and Non-Commissioned Officers

Jackson, Clarence Major
Wildman, Herbert Adjutant
Thomas, Richard R. Battalion Sergeant Major
Albrecht, Arno C. Color Sergeant
White, Harold C. Battalion Supply Sergeant

COMPANY A

Officers

Moore, Emmet B. Captain
Willson, Virgil A. Lieutenant

Non-Commissioned Officers

Cogswell, Edward B. Sergeant
Danaher, Thomas Sergeant
Lyndon, Lawrence Sergeant
Mountjoy, Raymond..... Corporal
Astle, Thomas Corporal
Sears, Arthur Corporal
Swan, Leonard Corporal
Van Fleet, George Corporal
Bulen, Aubrey Corporal
Stacy, Clarence Corporal

COMPANY B

Officers

Moore, Knox D.	Captain
St. Clair, Ward	Lieutenant
Dean, Richard Howell	Lieutenant

Non-Commissioned Officers

Hoffman, Carl	Sergeant
Lyndon, Charles A.	Sergeant
Alderson, William	Corporal
Gilbert, Leslie	Corporal
Mitchell, Fergus	Corporal
Wylie, Paul	Corporal
Gage, Perry	Corporal

COMPANY C

Officers

Miller, Harley R.	Captain
Cruzen, Fred T.	Lieutenant
Holderby, Jesse	Lieutenant

Non-Commissioned Officers

Brost, John N.	Sergeant
Felt, Herbert	Sergeant
McCarren, Ray	Sergeant
Rivenes, Alf	Sergeant
Buckingham, Earl	Corporal
Brook, John C.	Corporal
Richards, Albert B.	Corporal
Williams, Hallan A.	Corporal
Brown, Alva B.	Corporal
Tenney, Howard	Corporal

Register of Students

1920-1921

GRADUATE STUDENTS

Graduate Students Candidates for Degrees

Malsor, Roy E.....	Civil Engineering	Bozeman
McCabe, John	Electrical Engineering.....	Bozeman
Truitt, Charles Alonzo.....	Civil Engineering.....	Denver, Colo.
Sloan, Royal Daniel	Electrical Engineering.....	Bozeman

Graduate Students Not Candidates for Degrees

Abbey, Myron J.	Agronomy	Bozeman
Ballard, Mrs. Fannie G.....	Home Economics	Bozeman
Corkins, Clifford L.	Entomology and Zoology.....	Victor
Foote,, Herbert B.	Chemistry	Bozeman
Green, Byron M.	Mechanical Engineering	Bozeman
Griffin, Fred L.	Applied Art	Bozeman
Hall, Medra	Applied Science	Bozeman
Humphrey, Leo Chandler.....	Chemistry	Bozeman
Mashin, Ladimer	Secretarial Work	Chicago, Ill.
Maurer, Sidney	Agricultural Educ.....	Brooklyn,, Wn.
Owen, Judson Quincy	Mechanical Engineering.....	Bozeman
Pinckney, Reuben M.	Applied Science	Bozeman
Quaw, Marjorie	Home Economics	Bozeman
Stark, Albert P. Jr.....	Agricultural Education...	Livingston
Strand, Mollie Allen	Home Economics	Bozeman
Therkelsen, Eric	Mechanical Engineering	Bozeman
Tobey, Willard	Agricultural Education ...	Highwood

COLLEGE STUDENTS

SENIORS

Baker, Alfred	Animal Husbandry	Winnifred, Alta.
Beach, Ben	Agricultural Education	Belt
Beauchamp, Pearl Edith	Home Economics	Bozeman
Benepe, Lucien Loveland.....	Agronomy	Bozeman
Berg, Sigvald	Architectural Engineering	Helena

Borton, Carl D., Jr.	Civil Engineering	Glasgow
Bowen, John William	Animal Husbandry	Worden
Bowen, Lowell Emery	Architectural Engineering	Butte
Bradford, Loren O.	Architectural Engineering	Livingston
Burgess, Aline Nathalie	Secretarial Work	Bozeman
Burgess, Marjorie May	Home Economics	Bozeman
Bush, Elmer Joseph	Civil Engineering	Pony
DeVore, Lloyd Grant	Agricultural Education	Wibaux
Dickason, Gray David	Chemical Engineering	Butte
Drewiecke, Leo August	Agricul. Educ.	De Pere, Wis.
Durkee, Lindley Rathburn	Architectural Engineering	Polson
Eaton, Harold	Animal Husbandry	Poplar
Finch, Fred Ashton	Animal Husbandry	Dillon
Flanagan, Mary Catherine	Home Economics	Anaconda
Forbes, Emma Frances	Home Economics	Helena
Gibbs, Benjamin Franklin	Electrical Engineering	Harlowton
Gilman, Vergil Day	Agricultural Education	Bozeman
Hall, Bernice	Secretarial Work	Bozeman
Hart, Glenn J.	Electrical Engineering	Harlowton
Hastings, John LeRoy	Electrical Engineering	Joliet
Hauseman, Dean Miller	Secretarial Work	Virginia City
Hodgkiss, Grant Henry	Electrical Engineering	Choteau
Hollier, Myrtle	Home Economics	Bozeman
Hollingsworth, Harley	Architectural Eng.	Thornburg, Ia.
Johnson, Edith	Botany and Bacteriology	Lewistown
Kuhns, Raymond	Civil Engineering	Kalispell
Kyle, Frances	Home Economics	Bozeman
Limbert, Harvey Emmet	Animal Husbandry	Grandview, Wn.
Lowe, Burdette Helman	Applied Science	Sullivan, Ohio
Major, Glenn Burnham	Civil Engineering	Helena
Marquis, Minnie Ellen	Home Economics	Bozeman
Moebus, Henrietta Catherine	Home Economics	Butte
McConnell, Robert Ervie	Agricultural Education	Lewistown
McFarlin, George Clark	Agronomy	Los Angeles, Cal.
McFarlin, Alfred Emmett	Mechanical Eng.	Los Angeles, Cal.
McLaughlin, Eugene Milton	Industrial Chemistry	Billings
McRoberts, Lewis Henry	Industrial Chemistry	Bozeman
Mecklenburg, Walter Lewis	Animal Husbandry	Chance
Noble, Ruth Elizabeth	Home Economics	Whitehall
Pierce, Stephen Clark, Jr.	Chemical Engineering	Gridley, Cal.
Pool, Gussie Elizabeth	Botany and Bacteriology	Townsend
Pool, Vernie Viola	Home Economics	Townsend
Robinson, Ernest Cecil	Animal Husbandry	Lewistown
Ropes, Dorothy Eleanor	Home Economics	Helena

Rowe, Forrest Frank	Animal Husbandry	Elsinor, Cal.
Saldine, Emil John	Civil Engineering	Great Falls
Schneider, August Mills	Civil Engineering	Helena
Schurch, Edward Christian	Electrical Engineering	Deer Lodge
Stanley, Mary Edith	Secretarial Work	Whitehall
Steel, Frederick Kippen	Electrical Engineering	Great Falls
Sutherland, Edward Linn	Civil Engineering	Bozeman
Taylor, Homer C.	Agricul. Educ.	Bryant, Wn.
Thompson, Stewart McKinley	Electrical Engineering	Great Falls
Tripp, Helen Louise	Home Economics	Butte
Walker, John Paul	Agricultural Education	Bozeman
Ware, Frank Edward	Chemical Engineering	Park City
Waterman, Evelyn Pauline	Secretarial Work	Bozeman
Wesch, Florence Christina	Home Economics	Billings
Whitacre, Gladys Mary	Home Economics	Bozeman
Wiles, Glen Dewey	Industrial Chemistry	Columbia Falls
Wise, Willis Howard	Mechanical Engineering	Hardin
Wylie, John, Jr.	Civil Engineering	Bozeman

JUNIORS

Aitken, Malcolm D.	Agricultural Education	Polson
Alquist, Merrill K.	Civil Engineering	Conrad
Amer, Ray	Mechanical Engineering	Anaconda
Bancroft, Helen	Home Economics	Shepherd
Becker, Norma	Botany and Bacteriology	Bozeman
Benepe, Mrs. Katherine Buzzell	Applied Art	Conrad
Bennett, William Jonathan	Chemical Engineering	Anaconda
Bentall, Frank M.	Mechanical Engineering	Hathaway
Bergstrom, Arthur	Electrical Eng.	Minneapolis, Minn.
Black, Jesse	Civil Engineering	Whitehall
Bohart, Marjorie	Entomology and Zoology	Wilsall
Bole, Elizabeth	Chemistry	Bozeman
Bolles, Henry	Civil Engineering	Teigen
Bowlen, Wayne	Electrical Engineering	Red Lodge
Briggs, Ian A.	Agronomy	Connor
Briner, Ethel	Secretarial Work	Big Timber
Buzard, Marian	Home Economics	Bozeman
Callow, Merton	Electrical Engineering	Butte
Cameron, Ray Edison	Animal Husbandry	Terry
Carey, Helen M.	Secretarial Work	Polson
Chestnut, Ben	Civil Engineering	Anaconda
Clinkenbeard, Opal	Home Economics	Great Falls
Conklin, Melvin	Agricultural Education	Oswego
Cooley, Charlotte P.	Applied Art	Bozeman

Cruzen, Fred T.	Electrical Engineering	Havre
Davidson, Hazel	Home Economics	Townsend
Dean, R. Howell	Chemical Engineering	Bozeman
Degenhart, Frank	Electrical Engineering	Philipsburg
Ditty, Ethel W.	Applied Art	Lewistown
Donohoe, Carroll P.	Chemical Engineering	Whitehall
Donohue, Donald J.	Civil Engineering	Helena
Ebersole, Mary	Home Economics	Glasgow
Egan, Mary Ursula	Applied Art	Butte
Erdman, Wilson	Electrical Engineering	Libby
Fenton, John Stanley	Agricultural Education....	Clyde Park
Forrest, Mildred	Home Economics	Choteau
Gagle, Roy	Entomology and Zoology	Hobson
Gallier, Vera	Secretarial Work	Bozeman
Garven, William Fenimore	Electrical Engineering	Billings
Gittenger, William	Entomology and Zoology....	Manhattan
Haller, Helen Irene	Home Economics.....	Berkeley, Cal.
Harrer, Ruth	Home Economics	Belgrade
Hibbert, Norman W.	Animal Husbandry	Chicago, Ill.
Holderby, Jesse	Chemical Engineering	Bozeman
Holderby, Josephine	Chemistry	Bozeman
Holmesland, Marie	Applied Art	Sun River
Husemeyer, William T.	Electrical Engineering..	Warm Springs
Jacques, Henry	Electrical Engineering	Butte
Jones, Ada	Applied Art	Bozeman
Jones, Wilma	Home Economics	Bynum
Jorgenson, Arthur	Electrical Engineering	Helena
Kelly, Earl J.	Electrical Engineering	Bozeman
Kennedy, Walter	Electrical Engineering	Missoula
Keown, Kathryn	Chemistry	Bozeman
Kirk, Albert	Agronomy	Devon
Kruger, Arnold	Animal Husbandry	Plains
Lantz, Henry	Agricultural Education....	Cohomo, Ind.
Lillard, John J.	Agricultural Education	Bozeman
Lindsley, Marguerite	Botany & Bacteriology	Yel'stne Park
Lippert, William	Agricultural Education	Townsend
Lowman, Buford	Electrical Engineering	Darby
Luther, Merrill J.	Animal Husbandry	Choteau
Mathews, Gladys	Applied Art	Havre
Mathew, Emmet	Chemical Engineering	Bozeman
Mathew, Hollis W.	Animal Husbandry	Bozeman
Mink, Leon D.	Animal Husbandry	Huntley
Morphey, Lloyd Allen	Electrical Engineering....	Leadora, Ida.
Munson, Arthur M.	Electrical Engineering	Clancy

Muntzer, Theodosia V.	Home Economics	Butte
Nelson, Zelma	Home Economics	Dillon
Noble, Dorothy Altha	Home Economics	Great Falls
Omta, Anna	Home Economics	Bozeman
Pietsch, Lloyd	Agronomy	Bozeman
Pollard, Rolla	Chemical Engineering	Craig
Pouder, Oliver	Electrical Engineering	Billings
Preston, Edward	Electrical Engineering	Stevensville
Reed, Dorothy	Home Economics	Windham
Ritschel, Eva	Home Economics	Wisdom
Robertson, Eugene	Chemistry	Bozeman
Ryan, Ambrose	Electrcal Engineering	Great Falls
Sackett, Nona	Home Economics	Billings
Sayers, Leon D.	Chemistry	Bozeman
Sheffield, Dale	Mechanical Engineering	Seattle, Wn.
Shoebotham, Thomas	Chemical Engineering	Huntley
Smith, Lois	Home Economics	Bozeman
Smith, F. Huston	Agricultural Education ...	Culbertson
Sperling, Genevieve	Home Economics	Townsend
St. Clair, Ward	Electrical Engineering	Glasgow
Stranahan, Mary	Applied Art	Havre
Sucetti, Glen	Mechanical Engineering	Missoula
Sutherland, Sidney	Agronomy	Polson
Sweeney, Joseph	Agronomy	Chicago, Ill.
Trackwell, Rosemary	Home Economics	Bozeman
Walker, Ruby	Home Economics	Bridger
Watts, Willard	Mechanical Engineering ...	Anaconda
Wildman, Herbert	Secretarial Work	Knowlton
Williams, Jessie	Home Economics	Clayton, Wn.
Willis, Phillip	Mechanical Engineering	Roundup
Wocasek, Frances	Applied Art	Great Falls
Wylie, Paul	Animal Husbandry	Bozeman
Young, Ethel	Home Economics	Lewistown

SOPHOMORES

Albrecht, Arno	Civil Engineering	Great Falls
Alderson, William	Chemical Engineering	Bozeman
Anderson, Donald	Secretarial Work	Lake Hamilton, Fla.
Anderson, Vernon	Electrical Engineering	Kenosha, Wis.
Asbury, Fuhrman	Agriculture	Crow Agency
Bachman, Lester E.	Electrical Engineering ...	Grantsville
Barnum, Frank	Agriculture	Columbia Falls
Beckley, Frank	Agriculture	Chicago, Ill.
Bowen, Robert Mien	Electrical Engineering	Buffalo

Brandenburg, Marie	Home Economics	Bozeman
Brook, John C.	Mechanical Engineering.....	Judith Gap
Brook, Isabel	Home Economics	Judith Gap
Brown, Alva	Electrical Engineering	Moccasin
Bryan, Clarence	Secretarial Work	Billings
Buckingham, Earl	Civil Engineering	Ekalaka
Buckingham, William H.	Agriculture	Lavina
Bulen, Aubrey	Electrical Engineering	Bozeman
Burgess, Dorothy	Botany and Bacteriology.....	Bozeman
Campbell, J. Paul	Agriculture	Bozeman
Cashmore, Dewey	Industrial Chemistry	Dillon
Cates, Edward	Agriculture	Victor
Chesley, Rose	Secretarial Work	Hobson
Christiansen, Marion	Industrial Chemistry	Lancaster, Wn.
Cline, Beatrice Marie	Applied Art	Bozeman
Clothier, Francis Albert	Agriculture	Melrose
Cogswell, Edward B.	Chemistry	Helena
Cottingham, Edward B.	Chemical Engineering	Helena
Cox, Chloe	Home Economics	Ballantine
Dahlstrom, Laura	Home Economics	Billings
Dean, Dorothy	Home Economics	Bozeman
Dunavan, David	Agriculture	Creighton, Sask.
Ecton, Ray Dean	Secretarial Work	Manhattan
Elmer, Roma	Chemistry	Bozeman
English, Mary	Home Economics	Dupuyer
Erwin, George Lewis	Agriculture	Bozeman
Ewalt, Anita	Home Economics	Ekalaka
Felt, Herbert	Electrical Engineering	Anaconda
Finley, George	Agriculture.....	Mt. Vernon, Wn.
Fiscus, Adam	Mechanical Engineering	Bozeman
Flook, Bernice	Secretarial Work	Lewistown
Flook, Walter	Electrical Engineering	Lewistown
Ford, Ethan C.	Agriculture	Bozeman
Forswall, Oscar	Electrical Engineering	Belgrade
Fortin, Henry	Mechanical Engineering	Trego
Gage, Perry	Architectural Engineering.....	Bozeman
Gallagher, J. Patrick	Civil Engineering	Hysham
George, Marie	Home Economics	Billings
Getchell, Wayne	Chemical Engineering	Bozeman
Gilbert, Leslie	Mechanical Engineering	Perma
Graham, Lloyd	Agriculture	Kalispell
Griffiths, Clement	Entomology & Zoology	Donedin, N. Z.
Haines, Francis D.	Mechanical Engineering	Clancy
Halstead, Charles	Mechanical Engineering	Ashland

Hampton, Georgia	Home Economics	Jordan
Hannah, Stanford	Agriculture	Fort Benton
Hardy, Wellington C.	Mechanical Engineering	Forsyth
Hoffman, Carl O.	Chemical Engineering	Helena
Hollister, Bruce	Mechanical Engineering	DeKalb, Ill.
Hunt, Herma	Secretarial Work	Meridian, Idaho
Husemeyer, Carl T.	Electrical Engineering	Warm Springs
Jackson, Clarence	Civil Engineering	Virginia City
Johnson, Arthur	Agriculture	Fromberg
Johnson, Florence	Secretarial Work	Lewistown
Jones, Robert R.	Agriculture	Billings
Keeler, Marian	Secretarial Work	Crow Agency
Kellams, Louise	Secretarial Work	Bozeman
Kenck, Ralph	Agriculture	East Helena
Knight, Frank	Agriculture	Bozeman
Lange, Herbert	Electrical Engineering	Minneapolis
Leary, Wilfred	Electrical Engineering	Butte
Leckliter, Manila	Applied Art	Bozeman
Ludwig, Ernest	Electrical Engineering	Cascade
Lyndon, Charles	Agriculture	Lyndon, Alberta
Lyndon, William	Electrical Engineering	Lyndon, Alta.
Mahan, John	Secretarial Work	De Soto, Miss.
Manis, Beulah	Secretarial Work	Big Timber
Marston, Eleanor	Applied Art	Great Falls
Mashin, John	Agriculture	Chicago, Ill.
Matthews, Howard	Agriculture	Eddy
Matthews, Rowland	Agriculture	Eddy
McCann, Haary	Mechanical Engineering	Helena
McCarren, Ray	Electrical Engineering	Anaconda
McCray, Mrs. Adele	Botany and Bacteriology	Bozeman
Macdonald, Arthur	Agriculture	Spokane, Wn.
Michel, Magdalena	Home Economics	Bozeman
Mitchell, Fergus	Agriculture	Great Falls
Moebus, Marie	Home Economics	Butte
Moody, Alice	Home Economics	Butte
Moore, Cyril C.	Agriculture	Poplar
Mountjoy, Raymond	Agriculture	Kalispell
Neuman, Leonard	Electrical Engineering	Libby
Noble, Noneeta	Secretarial Work	Great Falls
Nordstrom, Harriette	Secretarial Work	Big Timber
Norton, Ruth L.	Secretarial Work	East Helena
Oberle, Nicholas	Electrical Engineering	Bozeman
Pasha, John	Agriculture	Bozeman
Paugh, John	Agriculture	Jeffers

Peterson, Millard	Botany and Bacteriology...	Culbertson
Philo, Clifford	Civil Engineering	Deer Creek, Minn.
Poorman, Mildred	Chemistry	Livingston
Popham, William Lee	Agriculture	Victor
Poulson, Edward B.	Mechanical Engineering	Laurel
Radcliffe, Joseph	Chemical Engineering	Fairfield
Rassley, George	Agriculture	Bozeman
Richards, Albert	Agriculture	Billings
Rider, Maude	Secretarial Work	Bozeman
Rivenes, Alf	Electrical Engineering	Glendive
Rodriquez, Juan	Agriculture	P. I.
Roth, Lillian	Secretarial Work	Great Falls
Rouse, James Byron	Agriculture	Libby
Rouse, Robley D.	Mechanical Engineering	Libby
Rundell, Harry	Agriculture	Whitehall
Sabin, George T.	Electrical Engineering	Bozeman
Schmid, Flora	Secretarial Work	White Sulphur Spgs
Schreiner, Olive	Chemistry	Townsend
Smith, Spencer	Agriculture	Bozeman
Sears, Thos. Arthur G.	Agriculture	Bozeman
Squier, Raymond	Electrical Engineering	Forsyth
Stacy, Clarence	Architectural Engineering...	Bozeman
Stanton, Malcolm	Electrical Engineering	Plains
Stevens, Irving T.	Agriculture	Harlowton
Street, Dewey	Secretarial Work	Bozeman
Swan, Leonard	Agriculture	Livingston
Stump, Fred	Electrical Engineering	Missoula
Swanson, Ruby	Applied Science	Troy
Tallman, Mildred	Applied Science	Bozeman
Tenney, Howard	Mechanical Engineering	Bozeman
Thomas, Richard	Electrical Engineering	Anaconda
Thompson, Anita	Chemistry	Great Falls
Todd, William	Secretarial Work	Bozeman
Towne, Katherine	Home Economics	Livingston
Tretsven, Oscar	Agriculture	Bozeman
Van Fleet, George	Applied Science	Bozeman
Waite, Janice	Secretarial Work	Big Sandy
Westlake, Myron	Agriculture	Bozeman
White, Harold C.	Mechanical Engineering	Bozeman
Whitney, Wallace	Mechanical Engineering	Livingston
Williams, Hallam	Electrical Engineering	Anaconda
Williams, Vere	Secretarial Work	Bozeman
Willson, Joseph	Secretarial Work	Bozeman
Wise, Homer A.	Chemical Engineering	Hardin

Wold, Dorothy	Home Economics	Laurel
Zacher, Vernon	Mechanical Engineering	Bozeman
Zuck, Merlin D.	Electrical Engineering	Flaxville

FRESHMEN

Adams, Lola	Applied Art	Bozeman
Alcorn, Mary Esther	Home Economics	Ballantine
Algeo, Theodore	Civil Engineering	Billings
Asbury, Ralph L.	Electrical Engineering....	Crow Agency
Astle, Thomas, Jr.	Chemical Engineering	Livingston
Atchison, Leonard	Mechanical Engineering ...	Salesville
Atterbury, Forrest J.	Secretarial Work	Lyman, Wn.
Atterbury, Hollis	Agriculture	Lyman, Wn.
Avery, Stewart	Mechanical Engineering....	Three Forks
Bailey, Evalyn	Applied Art	Helena
Bailey, Lois	Architectural Engineering	Great Falls
Baker, Graeme B.	Chemistry	Bozeman
Baldwin, Mary	Home Economics	Butte
Balyeat, Everett	Mechanical Engineering....	Great Falls
Barbour, J. Odell	Electrical Engineering....	Big Timber
Beck, Albert	Applied Art	Basin
Becker, Eaton	Agriculture.....	Washington, D. C.
Bell, Martin	Agriculture	Bozeman
Benolken, George	Industrial Chemistry	Livingston
Bickle, David, Jr.	Agriculture	Ismay
Bille, Stella	Home Economics	Bozeman
Binner, Roger	Agriculture	Malden, Mass.
Bohart, Seth	Secretarial Work	Wilsall
Booher, Mary	Home Economics	Manhattan
Brentford, Harry	Electrical Engineering	Hamilton
Bright, George	Chemistry	Terry
Brittain, John	Civil Engineering	Billings
Brockway, Russell	Agriculture	Kirby
Brook, Douglas	Agriculture	Whitehall
Bungag, Jaccinto	Agriculture	Three Forks
Bunney, William Edward	Chemical Engineering	Belfry
Burgess, Ormsby	Mechanical Engineering	Bozeman
Buzard, Walter	Secretarial Work	Bozeman
Callan, Thomas A.	Electrical Engineering	Anaconda
Cameron, Fred H.	Agriculture	Terry
Cameron, Kathleen	Applied Science	Bozeman
Campbell, Margaret	Home Economics	Hardin
Carnes, Paul	Agriculture	Lewistown
Chase, Helen	Home Economics	Bozeman
Cheney, Anne L.	Applied Science	Chicago, Ill.

Cheney, Clark	Agriculture	Twin Bridges
Chrestensen, Gladys	Applied Art	Bozeman
Chrystal, Margaret	Home Economics	Anaconda
Clarkson, George	Mechanical Engineering	Chinook
Cleveland, Alvin	Civil Engineering	Willow Creek
Cochran, Josie	Secretarial Work	Billings
Colbern, Kenneth	Agriculture	Bozeman
Conkling, Margaret	Home Economics	Bozeman
Conway, John Henry	Civil Engineering	Bozeman
Cooper, Frank James	Applied Art	Helena
Cottier, Glen Gordon	Applied Art	Great Falls
Coulter, Ray	Chemical Engineering	Helena
Cowan, Franklin	Entomology and Zoology	Victor
Cowan, Jack A.	Electrical Engineering	Bozeman
Danaher, Thomas	Civil Engineering	Helena
Davidson, Ruth	Home Economics	Townsend
Davis, Lowell E.	Electrical Engineering	Huntley
DeHart, Joseph	Applied Art	Helena
DeMuth, Hazel	Applied Art	Bozeman
Doherty, James	Agriculture	Detroit, Mich.
Duncan Scotta	Applied Art	Bozeman
Eckley, Daniel Fred	Agriculture	Ronan
Eckles, Mrs. Carrie B.	Secretarial Work	Helena
Egland, Albert B.	Mechanical Engineering	Big Timber
Evans, James	Architectural Engineering	Pryor
Ewalt, LeRoy	Architectural Engineering	Ekalaka
Farnum, Eunice	Home Economics	Harlem
Ferrell, Lewis J.	Chemistry	Pony
Finch, Carl	Electrical Engineering	Bozeman
Fladstol, Martha	Home Economics	Ashmoor
Foor, Forrest L.	Agriculture	Wibaux
Forrest, Harold J.	Agriculture	Choteau
Fox, Glenn A.	Chemical Engineering	Livingston
Friedl, Zita	Home Economics	Glasgow
Garry, Esther	Secretarial Work	Lewistown
Gaylord, Asa K.	Electrical Engineering	Great Falls
George, Ernest Herbert	Electrical Engineering	Harlowton
Gleason, Jay	Chemistry	Townsend
Goodman, Hyman	Chemical Engineering	Butte
Green, Mrs. Mattie	Applied Art	Bozeman
Griffith, John P.	Agriculture	Butte
Hall, Pruda	Botany and Bacteriology	Bozeman
Hannon, Champ	Agriculture	Darby
Hanson, Lloyd	Electrical Engineering	Choteau

Harper, Esmond	Agriculture	Whitehall
Harvey, Maurice	Electrical Engineering	Melrose
Hauf, Rupert D.	Agriculture	Hamilton
Hay, William D.	Agriculture	Hamilton
Heidelman, Paul	Electrical Engineering	Ronan
Heikkila, Adolph	Agriculture	Armington
Hembre, Julius O.	Agriculture	Greenwood, Wis.
Hinrichsen, Jean	Chemical Engineering	Richey
Hinrichsen, Solomon	Agriculture	Richey
Hoffland, Henry	Agriculture	Alliance, Neb.
Hollier, Stella	Secretarial Work	Bozeman
Holloway, John P.	Elect. Engineering	Washington, Ind.
Howard, Josephine	Home Economics	Bozeman
Hubber, George	Agriculture	Elt
Huls, Spencer	Agriculture	Corvallis
Irvine, William Ledlay	Mechanical Engineering	Philipsburg
Isaacs, Ivan V.	Agriculture	Camp Pass
Johnson, Frank	Agriculture	Bozeman
Johnson, George	Agriculture	Terry
Johnson, Gladys	Secretarial Work	Bozeman
Johnson, Paul	Electrical Engineering	Silver Bow Jct.
Johnston, Sidney	Secretarial Work	Roundup
Jones, Mrs. Ralph	Applied Art	Bozeman
Julio, J. Bert	Civil Engineering	Red Lodge
Kauffman, Harry N.	Agriculture	Kalispell
Kendall, Helena	Chemistry	Miles City
Keyes, Ethel	Home Economics	Bozeman
King, Charles S.	Mechanical Engineering	Forsyth
Kinmouth, Clarice	Secretarial Work	Billings
Kirk, Marguerite	Applied Science	Bozeman
Kirk, Marie	Home Economics	Devon
Kirk, Thomas S.	Agriculture	Berkeley, Cal.
Klingensmith, Edward	Mechanical Engineering	Livingston
Kohler, Charles S.	Agriculture	Bozeman
Kohnen, Katherine	Home Economics	Missoula
Krauss, Mary Heloise	Secretarial Work	Bozeman
Kremer, Jessica	Home Economics	Laurel
Kremer, William	Architectural Engineering	Laurel
Lawson, Mary	Chemistry	Livingston
Lawton, McQueen	Electrical Engineering	Vance, S. C.
Leach, Wilhelmina V.	Home Economics	Bozeman
LeCornu, George Donald	Agriculture	Kalispell
LeCornu, Paul	Agriculture	Kalispell
Lindseth, Joseph	Agriculture	Great Falls

Lund, Gage	Chemistry	Bozeman
Mahan, Mrs. Iola	Home Economics	Bozeman
Main, Dorothy	Home Economics	Kalispell
Manis, Bonnie	Secretarial Work	Big Timber
Mares, Lillian	Home Economics	Helena
Mares, Joseph	Chemical Engineering	Helena
Markin, Florence	Botany and Bacteriology	Bozeman
Mathews, Stephen Lewis	Electrical Engineering	Augusta
Maxey, Margaret	Applied Art	Bozeman
Maxey, Mary	Chemistry	Bozeman
McClench, Warren	Mechanical Engineering	Whitefish
McClintock, Alice	Home Economics	Joliet
McDermard, James Wilson	Electrical Engineering	Great Falls
Macdonald, Janet	Home Economics	Butte
McDonald, Donald	Agriculture	Butte
McDonnell, Ronald A.	Mechanical Engineering	Big Timber
McGuire, John Henry	Electrical Engineering	Anaconda
McHose, Harold	Agriculture	Edgar
McIntosh, Antoinette	Applied Science	Bozeman
McIntosh, Ruth Belle	Applied Science	Bozeman
McKibben, Mrs. Hazel	Home Economics	Bozeman
McLaughlin, Bernard W.	Civil Engineering	Hamilton
McLean, Thomas	Electrical Engineering	Harlowton
McNall, Hazel	Home Economics	Bozeman
McNaul, William	Electrical Engineering	Butte
Menard, Alice	Home Economics	Bozeman
Mentzer, Leila	Botany and Bacteriology	Bozeman
Meredith, Claude	Agriculture	Bozeman
Mikkelson, John Henry	Secretarial Work	Bozeman
Miller, Harley Ray	Electrical Engineering	Wolf Point
Millette, Francis	Agriculture	Darby
Monsos, Irving	Architectural Engineering	Gt. Falls
Moore, Knox D.	Entomology and Zoology	Billings
Moore, James William	Secretarial Work	Belgrade
Moore, Emmet	Mechanical Engineering	Bozeman
Morse, Mildred	Home Economics	Bozeman
Neely, Fay	Home Economics	Bozeman
Nelson, Anna	Home Economics	Windham
Nelson, Oakel	Applied Art	Dillon
Newkirk, Thelma	Home Economics	Cardwell
Newkirk, Francis	Chemical Engineering	Bozeman
Newell, Robert G.	Agriculture	Stevensville
Neuman, Ernest	Secretarial Work	Herron
Niebel, Esther C.	Applied Science	Bozeman

Nightser, Louise	Secretarial Work	Laramie, Wyo.
Odekirk, Beulah V.	Applied Science	Bozeman
Olcott Virginia	Chemistry	Billings
Olmstead, Phil	Electrical Engineering.....	Big Timber
Omta, Grace Herrick	Home Economics	Bozeman
O'Neill, William J.	Electrical Engineering	Butte
Pace, Clark	Secretarial Work	Whitehall
Patterson, Joseph C.	Electrical Engineering	Dillon
Peck, Gertrude May	Applied Science	Bozeman
Peck, Bertha M.	Applied Science	Bozeman
Peterson, Paul D.	Agriculture	Sidney
Peterson, Constance	Secretarial Work	Culbertson
Phythian, William Hayde	Mechanical Engineering	Billings
Plew, Maurine	Applied Art	Bozeman
Powers, Leroy	Agriculture	Ballantine
Powers, Walter	Mechanical Engineering	Neihart
Quimby, Oscar	Chemical Engineering	Helena
Quinn, Lawrence	Chemistry	Boulder
Ray, Zula Josephine	Secretarial Work	Belgrade
Reagan, Charles E.	Electrical Engineering	Corvallis
Reed, Arthur	Agriculture	Bozeman
Reed, Lola	Secretarial Work	Billings
Refsnes, Nellie	Home Economics	Anaconda
Rehberg, Elmer.....	Civil Engineering	Billings
Rennie, Andrew	Agriculture	Hobson
Reynolds, Philomena	Secretarial Work.....	Glendive
Rhodes, Lawrence	Secretarial Work	Billings
Rinnan, Julius	Electrical Engineering	Great Falls
Rivenes, Valborg A.	Applied Art	Glendive
Robert, Jennie	Applied Art	Bozeman
Ross, Richard	Agriculture	Pompey's Pillar
Sandberg, Ernest	Agriculture	Anaconda
Sands, Glen	Agriculture	Chinook
Savage, David	Agriculture	Worden
Scotten, George	Electrical Engineering	Butte
Schanck, Charles	Civil Engineering	Roberts
Schroeder, Hermann	Agriculture	Billings
Schroeder, Walter	Agriculture	Billings
Schrupp, Harold C.	Agriculture	Shepherd
Schurch, Charles	Chemical Engineering.....	Deer Lodge
Searle, Leonard	Agriculture	Valier
Selstrom, Ivan	Mechanical Engineering	Stockett
Shaw, Madeline	Secretarial Work	Big Timber
Simpson, Clarence	Mechanical Engineering	Plains

Slater, Harold	Agriculture	Geraldine
Slawson, Donald Boyd	Mechanical Engineering	Billings
Sletten, Theodore	Electrical Engineering	Wibaux
Smart, Harold D.	Electrical Engineering	Hamilton
Smith, Dorothy	Applied Art	Culbertson
Smith, Wilbur	Agriculture	Bozeman
Snyder, Howard	Secretarial Work	Livingston
Sparling, Emma Jane	Applied Science	Bozeman
Spaulding, George.....	Architectural Engineering	Bozeman
Sprinkel, Russell	Secretarial Work	Springfield, Ill.
Staebler, Lucille	Home Economics	Butte
Steinbach, William C.	Agriculture	Stearns
Storror, Andrew	Electrical Engineering	Butte
Stranahan, Alice	Home Economics	Fort Benton
Streeter, Harriette	Home Economics	Choteau
Stucky, Lena O.	Secretarial Work	Stanford
Suhr, Edgar	Secretarial Work	Great Falls
Swanson, Florence	Entomology and Zoology	Troy
Swanson, Frank	Chemical Engineering	Bozeman
Tait, Fred D.	Electrical Engineering	Howard
Taylor, Charles D.	Chemistry	Forsyth
Thomas, Edna	Secretarial Work	Rosebud
Thomas, Wilbur O.	Electrical Engineering	Jordan
Thompson, Harlan	Chemical Engineering	Billings
Thompson, Robert	Chemical Engineering	Bozeman
Thompson, Dura	Home Economics	Coaldale, Alberta
Thomason, Howard	Mechanical Engineering	Rumble Creek
Tidball, Dean O.	Electrical Engineering	Whitehall
Tootell, Dorothy	Chemistry	Great Falls
Udine, Edgar	Entomology and Zoology	Great Falls
Vashus, Malena	Home Economics	Glendive
Wagner, Joseph	Chemistry	Great Falls
Wagner, Paul C.	Agriculture	Pottsgrove, Pa.
Waite, Helen	Home Economics	Bozeman
Wallace, Harry M.	Electrical Engineering	Anaconda
Walter, James R.	Agriculture	Huntley
Wernli, Zelma	Secretarial Work	Bozeman
Wells, Dana E.	Secretarial Work	Park City
Williams, Hattie	Secretarial Work	Townsend
Willson, David	Mechanical Engineering	Virgelle
Willson, Vergel	Chemical Engineering	Virgelle
Wilson, Edward	Mechanical Engineering	Lewistown
Wilton, Frank	Secretarial Work	Bozeman
Winans, Marie K.	Secretarial Work	Livingston

Woodard, J. Wesley	Chemistry	Bozeman
Wright, Annie L.	Applied Science	Fayette, Mo.
Wunn, J. W.	Applied Science	Bozeman
Wylie, Dorothy Ruth	Applied Science	Bozeman
Zimdar, Elaska J.	Civil Engineering	Sullivan

SCHOOL OF AGRICULTURE

THIRD YEAR

Beglinger, John	Switzerland
Buttleman, William H.	Willow Creek
Cok, Peter	Willard, Ohio
Dahlstrom, Francis	Conrad
Flood, William G.	Bozeman
Hawk, Clarence	Missoula
Jacobson, Mathew L.	Neihart
Jensen, Johannes	Norway
Kortte, Ray	Larchwood
Lumburg, C. J.	Mapleton, Minn.
Mendel, Oran	Winifred
Peterson, Solomon	Atlanta, Kansas
Reynolds, Archie	Taketa, N. D
Splaneman, Paul	Oshkosh, Wis.
Swensen, Erling	Helena

SECOND YEAR

Bawden, William Edward	Missoula
Breiner, Leland	Missoula
Burns, George	Caledonia, N. Y.
Burroughs, Squire	Opheim
Dolve, Arthur Williams	Cushman
Gruel, Fred A.	Boyd
Harbo, Roald	Froid
Harlan, George	Bozeman
Hough, Ray	Belgrade
James, George C.	Helena
Karlsson, Aaron	Sweden
Lee, Hjalmer	Culbertson
Lee, Oliver	Culbertson
Neill, Frank	Helena
Proebstel, Charles	Stark
Riek, Hilmore	Scobey
Riley, George	Helena

Seeman, Gerritt	Bozeman
Sutherland, Milton C.	Hysham
Sutherland, Walter I.	Great Falls
Vander Veen, Rinse	Shepherd

FIRST YEAR

Aabo, John	Norway
Abare, William L.	Havre
Beebe, Leonard	Portland, Ore
Becker, Nicholas	White Bear Lake, Minn.
Beddow, Harriston	Chester
Berf, Olaf	Whitewater
Bergeron, Wilbrod J.	Quebec, Canada
Biering, Christian	Bozeman
Blackman, Warren A.	Oliver Gulch
Boyer, Frances E.	Laredo
Cameron, Ronald	Butte
Catelle, Joseph	Nashua
Cinquepolyn, Luigi	Bozeman
Clearwaters, Walter	Fort Benton
Collins, Milo	Reed Point
Corbett, Delbert S.	Garfield, Wash.
Dethlefsen, Wilbur	Hardin
Duncan, George	Bozeman
Ellison, Walter D.	Billings
Ferguson, Henry	Kirby
Filion, Gerald	Butte
Freiburg, Oscar	Centralia, Wn.
Galen, James Albert.....	Helena
Galloway, Carl V.	Logansport, Ind.
Gannon, George	New York City
Glosser, Frank	Kruger
Godtland, Paul	Butte
Graham, John	Irving, Ill.
Gruel, Carl O.	Boyd
Hammond, Merrise	Phon
Hennis, William H.	Cork, Ireland
Henerberry, William	Prince Edward Island, Canada
Hobby, Herbert	Plains
Jackson, Hugh	Browning
Kennedy, Frank	Boone, Iowa
Kerr, Russell	Victor
Kuehne, Fred C.	Riverside
Lange, Otto F.	Helena
Lanscigne, John	Fallon

Lanz, Fred	White Sulphur Springs
Larkin, Edwards	Chinook
Laubach, William	Dutton
Lawrence, Henry W.	Cheyenne Agency, S. D.
Leonard, Edward	Ekalaka
Link, Henry A.	Billings
Lund, Lawrence J.	Big Sandy
MacFarlane, Edgar	Havre
Marks, James R.	Sheridan, Wyo.
Mayo, Carl	Laredo
Miles, James J.	Goldstone
Molstead, Ole	Roy
Monger, Arnt J.	Malta
Moser, Leo Frederick	Cincinnati, Ohio
Mullen, Thomas J.	Glasgow
Myers, Charles E.	Auburn
Neuman, Louis B.	Odell
Norris, Gustav A.	Polson
Peeters, Petrus	Simpson
Peets, Earl	Bozeman
Penson, Charles	Kirby
Peterson, Arthur	Sumatra
Peterson, Johannes	Crane
Peterson, Harvey	Dutton
Peterson, James W.	Chicago
Ramsey, Robert	Helena
Redpath, George A.	Big Sandy
Rollwitz, Carl P.	Laurel
Ronan, Paul	Laurel
Roode, Dirk	Bozeman
Rudd, Rudolph	Van Norman
Rusek, Leon	Anaconda
Sensabaugh, Walter.....	Newark, Ohio
Slocum, Merrit	Malta
Sprague, Arthur M.	Hillsdale
Stevens, Howard	Oakdale, Cal.
Stoll, Harvey	Myers
Swanson, Olaf	Bozeman
Thompson, D. W.	Bozeman
Tobias, John	Wilsall
Van Voast, George W.	Geraldine
Wadsworth, George	Big Timber
Walker, Francis	Opheim
Weaver, James Harold	Bearmouth

Wheeler, Robert	Des Moines, Iowa
White, Joseph	Bozeman
Williams, William Ore	Kirby
Whitney, Clyde P	Loraine, Ill.
Winter, William Marcus	Humphreys
Woll, Hans Martin	Whitehall
Ziemkowski, Ralph A.	Hilger

SCHOOL OF HOME ECONOMICS

SECOND YEAR

Buttleman, Meta	Willow Creek
Mockel, Edna	Toston

FIRST YEAR

Birch, Marjorie	Livingston
Carter, Ruth	Livingston
Edmonson, Norma	Judith Gap
Geiger, Verna	Winston
Henry, Eunice	Chadborn
Wyatt, Norma	Bozeman

SCHOOL OF MECHANIC ARTS

SECOND YEAR

Brost, John	Nashua
Chapman, John	Bozeman
Hoines, Hjalmer	Luther
Lynch, Phil P.	Helmsville
Page, James A.	Twin Bridges
Weppler, George	Columbus
White, Aaron	Bozeman

FIRST YEAR

Ahlin, James W.	Drummond
Bannister, Roland	Angelo
Bigelow, Charles L.	Billings
Buck, Jack A.	Great Falls
Corrigan, Philip C.	Gold Creek
Creveling, Kenneth	Cascade
D'Ewart, Jerome	Wilsall
Drake, Elmer E.	Seattle, Wash.
Ecklund, Frank	Bozeman

Gallis, Ole	Kalispell
Gullings, Lawrence	Portage
Hausserman, Herman	Grey Cliff
Heal, Thomas	Simms
Loehding, Peter	Ekalaka
McAllister, Owen	McAllister
McClintick, John	Huntley
Metcalf, Alvin	Belgrade
Miles, James R.	Lonesome
Murphy, Robert	Ovando
Neilson, William M.	Bozeman
Norton, John D.	Drummond
O'Brien, William	Ireland
Raymond, Edgar	Highwood
Refer, Svend	Lewistown
Roed, Eugene	Fertile, Minn
Saisbury, Raymond	Bozeman
Simonson, Audley	Malta
Smith, Hector D.	Great Falls
Smith, Ralph	Home Park
TeSelle, Harry J.	Manhattan
Tomik, Simon	Austria
Venohr, Lawrence	Belt
Walden, Floyd H.	Ismay
Wernli, Raymond	Bozeman
Willis, Oscar	Deckervin, Mich.
Young, George C.	Hinsdale

SCHOOL OF MUSIC

Bailey, Evalyn	Piano	Helena
Bancroft, Helen	Voice	Shepherd
Benepe, Mrs. Katherine B.	Piano	Conrad
Bohart, Marjory E.	Piano	Wilsall
Brainard, Anna May	Piano	Bozeman
Brinig, Dorothy	Piano	Bozeman
Brook, Isabel	Piano	Judith Gap
Brown, Esther	Piano	Bozeman
Budd, Elva	Piano	Bozeman
Burgess, Aline	Piano	Bozeman
Burgess, Dorothy	Piano	Bozeman
Buzard, Marion	Piano	Bozeman
Campbell, Julia	Piano	Bozeman
Chrestensen, Gladys	Piano	Bozeman

Clinkenbeard, Opal	Piano	Great Falls
Cobleigh, Winifred	Piano	Bozeman
Coe, Frances	Piano	Bozeman
Cooley, Charlotte P.	Voice	Bozeman
Cooley, Genevieve	Piano	Bozeman
Degenhart, Frank	Violin	Phillipsburg
Ditty, Winifred Ethel	Voice	Bozeman
Ebersole, Mary Ida	Piano	Glasgow
Eckles, Mrs. Carrie B.	Piano	Helena
Forrest, Mildred	Piano	Choteau
Galliher, Edgar	Piano	Bozeman
Galliher, Wayne	Piano	Bozeman
Garry, Esther	Voice	Lewistown
Hall, Bernice	Piano	Bozeman
Haller, Helen	Piano	Berkeley, Cal.
Harrer, Ruth Warren	Piano	Belgrade
Henegan, Wanda	Piano	Bozeman
Hollier, Myrtle	Piano	Bozeman
Johnson, Florence	Piano	Lewistown
Jump, Mrs. Cecile	Piano	Bozeman
Keown, Kathryn	Piano	Bozeman
Kyle, Frances	Piano	Bozeman
Lehrkind, Bertha	Piano	Bozeman
Malm, Oliver	Piano	Bozeman
Mathews, Gladys	Voice	Havre
Marquis, Octavia	Piano	Bozeman
Maxey, Helen	Piano	Bozeman
Maxey, Laura M.	Piano	Bozeman
Mitchell, Alberta	Piano	Bozeman
Moebus, Henrietta	Piano	Butte
Muntzer, Theo. V.	Piano	Butte
Noble, Dorothy A.	Piano	Great Falls
Noble, Noneeta	Piano	Great Falls
Olcott, Virginia	Piano	Billings
Omta, Anna Margaret	Piano	Bozeman
Peterson, Lillian B.	Piano	Bozeman
Quinzy, Cleda	Piano	Bozeman
Quinzy, Olivia	Piano	Bozeman
Ray, Zula	Piano	Belgrade
Reed, Dorothy Marion	Piano	Windham
Ritschel, Eva	Piano	Wisdom
Robinson, Florence	Piano	Bozeman
Ross, Mrs. W. T.	Piano	Bozeman
Schmid, Flora	Piano	White Sulphur Springs

Sibley, Gertrude M.	Voice	Bozeman
Smith, Dorothy	Piano	Culbertson
Speith, Amelia	Piano	Bozeman
Stephens, Ruth	Piano	Bozeman
Stephens, Mary	Piano	Bozeman
Stranahan, Alice	Piano	Fort Benton
Swanson, Ruby	Piano	Troy
Taylor, Phillis	Piano	Bozeman
Tripp, Helen L.	Piano	Butte
Walker, Ruby Alma	Piano	Bridger
Watson, Mrs. Harry	Piano	Mt. Ellis
Williams, Hattie	Piano	Townsend
Williams, Jessie Iona	Piano	Clayton, Wash.
Young, Ethel Ellen	Piano	Bozeman

SUMMER SESSION OF 1920

Aitken, Florence	Entomology and Zoology	Bozeman
Alexander, Mrs. W. G.	Summer Session	Bozeman
Anderson, Vernon	Federal Board	Minneapolis
Andrews, Charles	Federal Board	New London, Minn.
Antonsen, Ruth E.	Summer Session	Bozeman
Bain, Lola M.	Summer Session	Bozeman
Barkley, James H.	Federal Board	Billings
Bauer, Cora B.	Summer Session	Circle
Beach, Ben	Agricultural Education	Mitchell
Becker, Norma L.	Secretarial Work	Bozeman
Beglinger, John	Federal Board	Lewistown
Belzer, Tusse L.	Summer Session	Choteau
Bergstrom, Arthur G.	Federal Board	Bozeman
Birkland, Marie	Summer Session	Melstone
Bond, Alva T.	Summer Session	Absarokee
Brown, Helen	Summer Session	Box Elder
Buckingham, William H.	Federal Board	Lavina
Burgess, Aline N.	Secretarial Work	Bozeman
Burns, George	Federal Board	Caledonia, N. Y.
Burroughs, Squire	Federal Board	Opheim
Busch, Louise M.	Summer Session	Bozeman
Buzard, Marion F.	Home Economics	Bozeman
Cardon, Mrs. Leah I.	Summer Session	Bozeman
Catelle, Joseph	Federal Board	Nashua
Challender, R. T.	Summer Session	Bozeman
Coates, Lorena E.	Summer Session	Seattle, Wash.

Cok, Peter	Federal Board	Willard, O.
Conkling, Margaret	Summer Session	Bozeman
Cox, Chloe	Home Economics	Ballantine
Cox, John A.	Federal Board	Kirby
Dale, William A.	Federal Board	Bozeman
DeVore, Lloyd G.	Agriculture	Been
Easton, Delia	Summer Session	Bozeman
Fiscus, Adam	Federal Board	Winifred
Flood, William G.	Federal Board	Clancy
Ferswall, Oscar	Federal Board	Belgrade
Galliher, Vera A.	Secretarial Work	Crow Agency
Gallagher, Rachael	Summer Session	Hysham
Gannon, George	Federal Board	New York City
Godtland, Paul	Federal Board	Butte
Gruel, Fred A.	Federal Board	Red Lodge
Gussenhoven, Lloyd L.	Federal Board	Butte
Haines, Francis D.	Federal Board	Clancy
Hall, Clara M.	Summer Session	Jefferson Island
Haller, Helen I.	Home Economics	Berkeley, Cal.
Hammond, Merris	Federal Board	Phon
Hannon, Lois	Summer Session	Darby
Harlan, George	Federal Board	Bozeman
Harper, Harry H.	Summer Session	Red Lodge
Hawk, Clarence A.	Federal Board	Missoula
Hennerberry, William	Federal Board	Morell
Hembre, Julius O.	Summer Session	Greenwood, Wis.
Higlee, John	Federal Board	Sand Coulee
Hoag, Henry	Federal Board	Whitefish
Hoffland, Henry H.	Summer Session	Malta
Holst, Mrs. J. H.	Summer Session	Bozeman
Ingunza, Paul	Summer Session	Lima, Peru, S. A.
Irvine, William L.	Summer Session	Philipsburg
Jacobson, Matt L.	Federal Board	Neihart
James, George C.	Federal Board	Helena
James, Herschel	Summer Session	Absarokee
Jensen, Johannes	Federal Board	Dagmar
Johnson, Grace L.	Summer Session	Bozeman
Johnson, Lola S.	Summer Session	Billings
Knox, Charles	Federal Board	Anoka, Minn.
Kortte, Ray	Federal Board	Larchwood
Kuhn, Charles	Federal Board	Great Falls
Lange Herbert L.	Federal Board	Minneapolis, Minn.
Lantz, H. L.	Federal Board	Cohomo, Ind.
Lantz, Mrs. H. L.	Summer Session	Cohomo, Ind.

LeCornu, Paul	Federal Board	Poplar
Lewis, Miles E.	Summer Session	Bozeman
Libratore, Marino	Federal Board	Great Falls
Lumburg, Charles	Federal Board	Cascade
Mahan, John W.	Federal Board	Bozeman
MacDonald, Plesah R.	Summer Session	Norris
McConnell, Iobert E.	Agricultural Education ...	Lewistown
McCray, Mrs. Adele W.	Botany and Bacteriology ...	Bozeman
McGill, Oro	Federal Board	Santa Fe, N. M.
McRoberts, Lewis H.	Chemistry	Bozeman
Mathae, Theresa	Summer Session	Lewistown
Matteson, Mary R.	Summer Session	Lancaster, Mich.
Maxey, Margaret	Summer Session	Bozeman
Mendel, Oren	Federal Board	Winnifred
Michel, Magdalena E.	Summer Session	Bozeman
Miles, James A.	Federal Board	New York City
Molestad, Ole	Federal Board	Roy
Murphy, Albert L.	Federal Board	Calgary, Alberta
Murphy, Mary A.	Summer Session	Butte
Nelson, Melba	Summer Session	Bozeman
Newell, Robert G.	Federal Board	Stevensville
O'Brien, William	Federal Board	Ireland
Patten, Margaret	Summer Session	Bozeman
Paull, Albert	Federal Board	Butte
Perring, Maude V.	Summer Session	Bozeman
Peterson, Emil	Summer Session	Sumatra
Peterson, Ragna	Summer Session	Livingston
Peterson, Solomon	Federal Board	Mosby
Philo, Clifford A.	Federal Board	Deer Creek, Minn.
Pierce, Stephen C., Jr.	Chemical Engineering....	Gridley, Cal.
Plew, Maurine L.	Summer Session	Bozeman
Porter, Claude L.	Federal Board	Winifred
Potter, Mrs. Nell G.	Summer Session	Ringling
Radcliffe, Jos. H.	Chemistry	Fairfield
Ramsey, Robert F.	Federal Board	Bozeman
Rash, Gladys I.	Summer Session	Reed Point
Redman, Benjamin	Federal Board	Great Falls
Renlund, Edith S.	Summer Session	Red Lodge
Reynolds, Archie	Federal Board	Fort Benton
Riley, George	Federal Board	Chinook
Robinson, Frances	Summer Session	Bozeman
Rogers, Eula	Summer Session	Eureka
Rose, Helen	Summer Session	Bozeman
Sales, John A.	Federal Board	Cathay, N. D.

Schofield, Nellie	Summer Session	Darby
Seeman, Gerritt	Federal Board	Columbus
Sheridan, Lorena	Summer Session	Bozeman
Smith, Inez	Summer Session	Bozeman
Smith, Wilbur E.	Federal Board	Bozeman
Spaulding, Geo. W.....	Federal Board	Salesville
Splaneman, Paul	Federal Board	Chinook
Stevens, Howard L.	Federal Board	Watford, N. D.
Story, Mayo	Summer Session	Bozeman
Strandlund, Elmer T.	Summer Session	Homestead
Sutherland, Edward L.	Federal Board	Bozeman
Sutherland, Walter	Federal Board	Great Falls
Sweet, Albert E.	Federal Board	Butte
Tallman, Hazel	Summer Session	Bozeman
Tallman, Mildred	Secretarial Work	Bozeman
Tessmer, Amelia	Summer Session	Waucoma, Iowa
Thompson, Anita T.	Chemistry	Bozeman
Tomik, Simon	Federal Board	Galicia, Austria
Vander Veen, Rinse	Federal Board	Shepherd
Walker, Francis E.	Federal Board	Opheim
Walker, J. Paul	Agricultural Education	Bozeman
Walvoord, Cornelia	Summer Session	Cedar Grove, Wis.
Webber, Ella	Summer Session	Chadburn
Wiles, Glenn D.	Chemistry	Columbia Falls
Wood, Ernest C.	Federal Board	Loama
Zacher, Vernon B.	Federal Board	Bozeman

FARMERS' WEEK

Anderson, A. D.	Harlowton
Arkwright, H. D.	Miles City
Batey, Harry H.	Wilsall
Beier, F. W.	Helena
Benjamin, Mrs. W. R.	Elloam
Blain, Sid	Culbertson
Bond, George	Bozeman
Boss, John	Belgrade
Boucher, A. C.	Great Falls
Boyer, M. J.	Highwood
Chase, C. B.	Harrison
Clarkson, R. H.	Chinook
Coleman, A. W.	Springdale
Conser, C. C.	Plevna
Cook, Edgar R.	Twin Bridges

Cook, Mrs. E. R.	Twin Bridges
Curran, Lucy A.	Poplar
Daniels, Mrs. C. W.	Billings
Dennegan, Leonore	St. Paul
Donohue, Mrs. Della	Sioux Pass
Edwards, Mrs. A. B.	Harlowton
Engles, Walter	Bozeman
Freeman, Russell	Absarokee
Gilchrise, Hudson	Bozeman
Griswold, Mrs. J. H.	Moiese
Griswold, J. H.	Moiese
Hampton, Sam	Anad
Hambre, Berger M.	Forsyth
Harlan, W. B.	Como
Hartman, Mrs. George.....	Kalispell
Herbst, Mrs. A. C.	Libby
House, W. H.	Bozeman
Hudson, C. W.	Norris
Irvine, William L.	Pipestone Springs
Jimison, Henry L.	Calkins
Kay, J. M.	Howard
Keys, James E.	Helena
Knowles, Ferdinand	Big Timber
Kraft, Mrs. Merretta	Bozeman
Kraft, Charles F.	Bozeman
Kraft, Ruth	Bozeman
Kraft, Walter C.	Bozeman
Kruger, Arthur	Terry
Leefeldt Carl H.	Sidney
Lemmon, John L.	Judith Gap
Lillard, J. Wales	Bozeman
Lindsey, Mrs. W. G.	Hobson
Mackenzie, Mary	Coffee Creek
Mackenzie, William	Coffee Creek
MacSpadden, F. E.	Great Falls
McMannis, Mrs. C. J.	Molt
McMannis, Charles J.	Molt
McCormick, Mrs. Minnie	Kalispell
McDonald, Samuel E.	Helmville
McSeer, J. W.	Bozeman
Mendenhall, D. W.	Glendive
Merritt, W. J.	Townsend
Mheurs, G.	Manhattan
Morehead, Mrs. G. R.	Great Falls

Newkirk, Francis M.	Cardwell
Nye, Mrs. Ward H.	Billings
O'Donnell, J. D.	Billings
Oliver, R. B.	Bozeman
Opperguard, O. M.	Savage
Pembere, S. T.	Forsyth
Penwell, Merritt	Belgrade
Pound, Edmund	Lavina
Purdum, Mrs. H. F.	Union
Radcliffe, Henry	Fairfield
Ramage, G. M.	Manhattan
Reese, John D.	Bozeman
Roberts, Chester	Park City
Rohla, August	Clarkston
Shaw, Emma D.	Utica
Shaw, George H.	Utica
Shewater, A. J.	Columbus
Sime, Mrs. C. E.	Bozeman
Sime, C. E.	Bozeman
Slavens, Mrs. W. E.	Molt
Smith, Mrs. C. J.	Mizpah
Stafford, A. H.	Bozeman
Stevens, D.	Bozeman
Stewart, David	Crane
Stockton W. H.	Clarkston
Stohl, H. S.	Laurel
Stord, A. W.	Laurel
Summer, F. E.	Clyde Park
Sutu, John	Malta
Thornber, Harvey	Victor
Tucker, Mrs. W. J.	Harlowton
Turley, Mrs. E. F.	Helena
Tuttle, Mrs. J. F.	Hinsdale
Walton, John	Belgrade
Warren, Mrs. Ruth	Hamilton
Weaver, Arthur D.	Belgrade
Wells, Wilmont H.	Judith Gap
Wells, Edward	Woodside
Whipple, Mrs. R. A.	Molt
Williams, Lee	Bozeman
Wills, Elevine D.	Judith Gap
Wilson, B. O.	Pray
Yerrington, Mrs. C. M.	Miles City

Summary of Registration

	1919-20			1920-21		
	Men	Women	Total	Men	Women	Total
College of Agriculture	102	0	102	135	0	135
College of Engineering.....	190	0	190	214	1	215
College of Applied Science....	31	23	54	26	38	64
College of Household and Industrial Arts	24	149	173	31	162	193
School of Home Economics....	0	17	17	0	8	8
School of Mechanic Arts.....	86	0	86	43	0	43
School of Agriculture.....	143	0	143	126	0	126
School of Music.....	23	90	113	4	68	72
Total	599	279	878	579	277	856
Summer Quarter	15	239	254	84	56	140
Farmers' Week	136	23	159	72	30	102
Total	750	541	1291	735	363	1098
Counted Twice	17	49	66	62	55	117
Grand Total	733	492	1225	673	308	981

SUMMARY OF REGISTRATION BY COUNTIES

Beaverhead County	7
Big Horn County	17
Blaine County	2
Broadwater County	12
Carbon County	15
Carter County	5
Cascade County	44
Chouteau County	15
Custer County	7
Dawson County	10
Deer Lodge County	18
Fallon County	1
Fergus County	32
Flathead County	20
Gallatin County	267
Garfield County	6
Glacier County.....	2
Granite County	7
Hill County	10
Jefferson County.....	18
Lewis and Clark County	32
Lincoln County	11
McCone County	3
Madison County	15
Meagher County	5
Missoula County	12
Musselshell County	4
Park County	29
Phillips County	5
Pondera County	5
Powder River County	2
Powell County	6
Prairie County	6
Ravalli County	19
Richland County	5
Roosevelt County	15
Rosebud County	16
Sanders County	11
Sheridan County	3
Silver Bow County	30
Stillwater County	9
Sweet Grass County	12
Teton County	13

Toole County	2
Treasure County	1
Valley County	15
Wheatland County	12
Wibaux County	4
Yellowstone County	58
<hr/>	
Total Montana	875
Other States	106
<hr/>	
Grand Total	981

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PUBLICATIONS of THE UNIVERSITY of MONTANA

Copies of the several series of the University of Montana Bulletin, of the University of Montana Circular, and the University of Montana Syllabi, may be obtained upon request from the President of the particular institution concerned. Copies of the University of Montana Studies and of the General Series of the Bulletin and of the Circular may be obtained from the office of the Chancellor of the University.

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Each series of the Bulletin is issued quarterly, and contains annual reports, catalogues, etc.

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2. STATE UNIVERSITY SERIES.
3. MONTANA STATE COLLEGE SERIES.
4. EXPERIMENT STATION SERIES.
5. NORMAL COLLEGE SERIES.
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UNIVERSITY OF MONTANA BULLETIN

Montana State College Series

No. 22

MONTANA STATE COLLEGE

Colleges of Agriculture, Engineering,
Applied Science, Household and Industrial Arts,
Secondary School of Agriculture.

TWENTY-NINTH ANNUAL CATALOGUE

1921-1922

**ANNOUNCEMENTS FOR
1922-1923**

**BOZEMAN, MONTANA
MAY, 1922**

Entered at Bozeman, Montana, as Second Class Matter Under Act of Congress
August 24, 1912.

THE UNIVERSITY OF MONTANA

EDWARD C. ELLIOTT, Chancellor of the University.

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, Approved March 14, 1913, (effective July 1, 1913).

The general control and supervision of the University are vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

Montana State Board of Education

J. M. DIXON, Governor.....	Ex-officio, President
W. D. RANKIN, Attorney General.....	Ex-officio
MAY TRUMPER, Supt. of Public Instruction.....	Ex-officio, Secretary
A. J. VIOLETTE.....(1922)	WHITFIELD SPAIN.....(1924)
SYDNEY SANNER.....(1922)	J. W. FREEMAN.....(1924)
C. H. FOOT.....(1923)	JOHN DIETRICH.....(1925)
R. C. LINE.....(1923)	FRANK ELIEL.....(1925)

The University comprises the following institutions, schools and departments:

The State University, Missoula

Established February 17, 1893, and consisting of

The College of Arts and Sciences	The School of Education
The School of Law	The School of Business Administration
The School of Pharmacy	The Summer Quarter
The School of Forestry	The Biological Station
The School of Journalism	(Flathead Lake)
The School of Music	The Public Service Division
	The Graduate Division

CHARLES H. CLAPP, President

The Montana State College Bozeman

Established February 16, 1893, and consisting of

The College of Agriculture	The School of Music
The College of Engineering	The Summer Quarter
The College of Applied Science	The Secondary School of Agriculture
The College of Household and Industrial Arts	The Agricultural Experiment Station
	The Agricultural Extension Service

ALFRED ATKINSON, President

The State School of Mines, Butte

Established February 17, 1893.

Course in Mining Engineering. Course in Metallurgical Engineering
Bureau of Mines and Metallurgy

GEORGE W. CRAVEN, President

The State Normal College, Dillon

Established February 23, 1893, and consisting of

The Teachers' Certificate Course	The Four-years Course
The Three-years Course	The Rural Teachers' Course
	Teachers' Service Division

SHELDON E. DAVIS, President

For publications and detailed information concerning the different schools and colleges address the President of the particular institution concerned. Communications intended for the Chancellor of the University should be addressed to the State Capitol, Helena, Montana.

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Calendar

1922-1923

SPRING QUARTER

1922

March 25, Saturday	Registration for New Students
March 27, Monday	Instruction Begins
May 6, Saturday	Standing of Students Reported
May 30, Tuesday	Memorial Day, a Holiday
June 8-10, Thursday-Saturday	Examinations
June 11, Sunday	Baccalaureate Address
June 14, Wednesday	Commencement

SUMMER QUARTER

June 19, Monday	First Term Begins
July 4, Tuesday.....	Independence Day, a Holiday
July 28, Friday	First Term Ends
July 31, Monday	Second Term Begins
September 1, Friday	Second Term Ends

AUTUMN QUARTER

September 26-27, Tuesday-Wednesday	Registration Days
September 28, Thursday	Instruction Begins
November 10, Friday	Standing of Students Reported
November 30, Thursday	Thanksgiving Day, a Holiday
December 20-22, Wednesday-Friday.....	Examinations and Registration
December 22, Friday, Noon	Quarter Ends; Christmas Recess Begins.

1923

WINTER QUARTER

January 3, Wednesday	Registration of New Students
January 3, Wednesday.....	Christmas Recess Ends Instruction Begins.
February 10, Saturday.....	Standing of Students Reported
March 7-10, Wednesday-Saturday	Interscholastic Conference and Basketball Tournament
March 21-23, Wednesday-Friday.....	Examinations and Registration

SPRING QUARTER

March 24, Saturday	Registration of New Students
March 26, Monday	Instruction Begins
May 5, Saturday	Standing of Students Reported
May 30, Wednesday	Memorial Day, a Holiday
June 7-9, Thursday-Saturday	Examinations
June 10, Sunday	Baccalaureate Address
June 13, Wednesday	Commencement

SUMMER QUARTER

June 18, Monday	First Term Begins
July 4, Wednesday	Independence Day, a Holiday
July 27, Friday	First Term Ends
July 30, Monday	Second Term Begins
August 31, Friday	Second Term Ends

AUTUMN QUARTER

September 25-26, Tuesday-Wednesday	Registration Days
September 27, Thursday	Instruction Begins
November 10, Saturday	Standing of Students Reported
November 29, Thursday	Thanksgiving Day, a Holiday
December 19-21, Wednesday-Friday	Examinations and Registration
December 21, Friday, Noon	Quarter Ends; Christmas Recess Begins

Note—Special examinations for removing entrance conditions, securing advanced credit, or removing conditioned grades are given on days set aside for final examinations at the end of each quarter.

An act of the Seventeenth Legislative Assembly provides that schools shall not be dismissed on the following days, but appropriate exercises, as a part of the day's program shall be held in each school when in session: February 12, (Lincoln's birthday), February 22, (Washington's birthday), second Tuesday of May (Arbor Day), June 14 (Flag Day), October 12 (Columbus Day), November 1, (Pioneer Day), November 11, (Armistice Day).

Official Directory

EXECUTIVE BOARD

ALFRED ATKINSON (ex-officio), Chairman.....	Bozeman
J. H. BAKER (term expires April 1923)	Bozeman
W. S. DAVIDSON (term expires April 1925).....	Bozeman
ALLEN CAMERON, Secretary-Treasurer.....	Bozeman

ADMINISTRATIVE OFFICERS

EDWARD C. ELLIOTT, Ph. D.....	Chancellor of the University of Montana
ALFRED ATKINSON, D. Sc.	President
FREDERICK B. LINFIELD, B. S. A.....	Dean of Agriculture and Director of the Experiment Station
FRED S. COOLEY, B. S.....	Director of the Extension Service
JAMES M. HAMILTON, M. S.....	Dean of Men
UNA B. HERRICK	Dean of Women
EARLE B. NORRIS, M. E.....	Dean of Engineering
JOHN H. HOLST, M. A.....	Principal of the Secondary School and Director of the Summer Session
ROY ORVIS WILSON, B. S.	Registrar
MIRDYALEEN MAXWELL.....	House Director at Hamilton Hall
ADELE MCCRAY.....	College Nurse
RAY B. BOWDEN.....	Editorial Director

THE FACULTY

Professors

ABBEY, MYRON J.	Professor of Agricultural Education A. B., Brown University, 1902.
ARNETT, CLARE NEWTON.....	Professor of Animal Husbandry and Vice-Dean of Agriculture B. S. A., Purdue University, 1907.
ATKINSON, ALFRED.....	President B. S., Iowa State College, 1904; M. S., Cornell University, 1912; D. Sc., Iowa State College, 1920.
BRANEGAN, GLADYS.....	Professor of Home Economics B. S., University of Wisconsin, 1913; A. M., Teachers College, Columbia University, 1920.
BREWER, WILLIAM F.....	Professor of English A. B. Grinnell College, 1891; A. M., 1897; A. M., Harvard University, 1899.
CALDWELL, VERNON A.....	Professor of Military Science and Tactics Colonel, U. S. Army Rtd.

- COBLEIGH, WILLIAM M.....Professor of Chemistry and Chemical Engineering
A. M., Columbia University, 1899.
- CONKLING, LEON D.....Professor of Civil Engineering
C. E., Cornell University, 1900.
- COOLEY, ROBERT A.....Professor of Entomology and Zoology
B. S., Massachusetts Agricultural College, 1895.
- CURRIER, EDWIN L.....Professor of Farm Management
B. S., University of Nebraska, 1912.
- FORREST, ELIZABETH.....Librarian
B. L. S., University of Illinois, 1906; A. M., University of Chicago, 1917.
- GRAVES, D. V.....Professor of Physical Education
- HAM, FRANK W.....Professor of Physics
B. S., Montana State College, 1903; M. S., 1905.
- HAMILTON, JAMES M.....Dean of Men and Professor of Economics
B. S., Union Christian College, 1887; M. S., 1890.
- HARRINGTON, FRANK M.....Professor of Horticulture
B. S., Oregon Agricultural College, 1913; M. S., Iowa State College, 1921.
- HERRICK, UNA B.....Dean of Women's Work and Director of Physical Education for Women
- HOLST, JOHN H.....Professor of Education and Psychology,
Director of Secondary Work and Summer Session
A. M., University of Montana, 1918; A. M., Columbia University, 1921.
- HOWARD, WILLIAM.....Professor of Piano and Violin,
Director of Music
Graduate, New England Conservatory of Music, 1891.
- LINFIELD, FREDERICK B.....Dean of Agriculture
B. S. A., Ontario Agricultural College, 1891.
- MARTIN, GEORGE LESTER.....Professor of Dairy Husbandry
B. S., Iowa State College, 1908.
- McKEE, CLYDE.....Professor of Agronomy
B. S., Kansas State Agricultural College, 1910.
- MURDOCK, HARVEY E.....Professor of Agricultural Engineering
B. S., University of Colorado, 1906; M. E., 1908; C. E., 1911.
- NORRIS, EARLE B.....Dean of Engineering and Professor of Mechanical Engineering
B. S., Pennsylvania State College, 1904; M. E., 1908.
- PLEW, WILLIAM R.....Professor of Architectural Engineering
B. S., Rose Polytechnic Institute, 1907; M. S., 1910; A. E., University of Illinois, 1920.
- SCHOPPE, WILLIAM F.....Professor of Poultry Husbandry
B. S., University of Maine, 1907; M. S., 1913.

- SWINGLE, DEANE B.....Professor of Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.
- TALLMAN, WILLIAM D.....Professor of Mathematics
B. S., University of Wisconsin, 1896.
- *THALER, JOSEPH A.....Professor of Electrical Engineering
E. E., University of Minnesota, 1900.
- WELCH, HOWARD.....Professor of Veterinary Science
A. B., University of Missouri, 1902; B. S. A., 1906; D. V. M., Cornell University, 1909.
- WILSON, ROY ORVIS.....Professor of Secretarial Studies and Registrar
B. S., South Dakota State College, 1911.

Associate Professors

- BREWER, HELEN R.....Associate Professor of History
A. B., Grinnell College, 1888.
- CHALLENGER, RALPH T.....Associate Professor of Mechanical Engineering
B. S. Kansas State Agricultural College, 1908; M. E., 1918.
- SLOAN, ROYAL D.....Associate Professor of Electrical Engineering
B. S., Montana State University, 1913; E. E., Montana State College, 1921.
- THERKELSEN, ERIC.....Associate Professor of Electrical and Mechanical Engineering
B. S., University of Washington, 1911; M. S., 1913.

Assistant Professors

- CAMPBELL, JEAN N.....Assistant Professor of French and Spanish
A. B., Washburn College, 1909; A. M., University of Kansas, 1910.
- *DONALDSON, JESSIE.....Assistant Professor of English
A. B., University of Minnesota, 1913.
- FRANKS, EDITH.....Assistant Professor of Home Economics
- GIESEKER, LEONARD F.....Assistant Professor of Agronomy
B. S., University of Nebraska, 1908; M. S., Cornell University, 1914.
- GRANT, EUGENE L.....Assistant Professor of Civil Engineering
B. S., University of Wisconsin, 1917.
- HANNON, OLGA ROSS.....Assistant Professor of Art and Head of Department
Graduate of Normal Course, Chicago Academy of Fine Arts, 1911;
Graduate, Snow-Forehlick School of Industrial Arts, 1920.

*On leave of absence.

- HOLMES, WILLIAM BARTHOLOMEW.....Assistant Professor of Secretarial
Studies
B. S., James Milliken University, 1913.
- HOMANN, FREDERICK C.....Assistant Professor of Mechanical
Engineering
B. S., Montana State College 1916.
- JENNISON, HARRY M.....Assistant Professor of Botany and
Bacteriology
B. S., Massachusetts Agricultural College, 1908; A. M., Wabash College, 1911.
- JOSEPH, WALTER EDWARD.....Assistant Professor of Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.
- KIEFER, JAMES A.....Assistant Professor of Physics
B. S., Montana State College, 1914.
- LUDWIG, ALFRED.....Assistant Professor of Mechanical Engineering
C. E., Rensselaer Polytechnic Institute, 1889.
- MCCALL, WILLIAM H.....Assistant Professor of English
A. B., Ohio Wesleyan University, 1900; A. M., 1904.
- MCHORD, ROBERT C.....Assistant Professor of Animal Husbandry
A. B., Central University, 1908; B. S. A., Iowa State College, 1913.
- McSWEENEY, ALBERT A.....Assistant Professor of Mathematics
A. B., Upper Iowa University, 1911; A. M., State University of Montana
1915.
- OWEN, JUDSON.....Assistant Professor of English
A. B., Illinois Wesleyan University, 1913; A. M., University of Wisconsin,
1920.
- QUINN, EDMOND JOHN.....Assistant Professor of Chemistry
B. S., Notre Dame University, 1911.
- REGAN, W. S.....Assistant Professor of Entomology
B. S., Massachusetts Agricultural College, 1908; Ph. D., 1915.
- SPAULDING, MILO H.....Assistant Professor of Zoology
A. B., Leland Stanford Junior University, 1903; A. M., 1906.
- STARRING, CECIL C.....Assistant Professor of Horticulture
B. S., South Dakota State College, 1911.
- SUMNER, HARLAN R.....Assistant Professor of Agronomy
B. S. A., Kansas State Agricultural College, 1916; A. M., University of
Missouri, 1917.
- TEAR, JULIA.....Assistant Professor of Home Economics
Diploma, Chicago Normal, 1906; A. B., University of Illinois, 1911.
- WELLS, LANSING S.....Assistant Professor of Chemistry
B. A., State University of Montana, 1915; A. M., University of Illinois, 1917;
Ph. D., 1919.

Instructors

- BARKER, JAMES R.....Instructor in Agricultural Engineering
B. S., Utah Agricultural College, 1921.
- BULL, FRIEDA M.....Instructor in Mathematics
B. S., Montana State College, 1907; M. S., 1909.
- BYRAM, EDITH.....Instructor in Piano
Diploma, Faelten Pianoforte School, Boston, 1920.
- CHEEVER, H. C.....Instructor in Architectural Engineering
B. S., University of Illinois, 1921.
- CHURCH, RAYMOND G.....Building Inspector
- DAVIS, BEATRICE FREEMAN.....Instructor in English
B. S., Montana State College, 1900; Ph. B., University of Chicago, 1902.
- FISKE, JOHN M.....Instructor in Electrical Engineering
B. S., Montana State College, 1915.
- GILLESPIE, SALLIE.....Instructor in Art
B. Ds., Tulane University, 1920.
- GRIFFIN, FRED L.....Instructor in Agricultural Engineering
- HADLEY, MARTHA.....Instructor in Voice
Graduate, New England Conservatory, 1912.
- HOLMSTROM, RUBY.....Instructor in Home Economics
B. S., Lake Forest College, 1910; A. M., University of Chicago, 1915.
- HOWARD, LOUIS L.....Instructor in Band Music
- JENSEN, IRVING.....Instructor in Agronomy
B. S., Utah Agricultural College, 1918.
- KAHAN, ROSE.....Cataloguer
A. B., University of Washington, 1908.
- KATELY, FRED W.....Instructor in Forge and Foundry
- LINDBLOM, ANNA E.....Instructor in English
A. B., Iowa State University, 1912; A. M., 1915.
- McMAHON, A. L.....Instructor in Animal Husbandry
B. S., University of Wisconsin, 1921.
- *MARSHALL, WALTER V.....Building Inspector
B. S., University of Michigan, 1915.
- MAXWELL, LORA M.....Instructor in Physical Education
B. Pd., Montana State Normal College, 1911.
- MAXWELL, MIRDYALEEN.....Instructor in Institutional Management
B. S., University of Minnesota, 1914; M. S., Columbia University, 1919.
- MERRILL, ROBERT M.....Instructor in Agricultural Engineering
B. S., Iowa State College, 1917.

*Beginning April 1, 1922.

SIBLEY, GERTRUDE M.	Instructor in English
A. B., Mount Holyoke College, 1913.	
SIPPEL, O. A.	Instructor in Beekeeping
B. S. A., Ontario Agricultural College, 1921.	
SWEAT, RUTH	Instructor in Home Economics
B. S., Montana State College, 1916.	
TRETSVEN, OSCAR	Instructor in Animal Husbandry
WILLSON, FRED F.	Lecturer in Architectural Engineering
B. S., Columbia University, 1902.	
WILSON, E. S.	Instructor in Chemistry and Assistant Athletic Coach
B. S., Texas Agricultural College, 1920.	
YOUNG, DELLA A.	Instructor in Stenography and Typewriting
Pd. M., Colorado Teachers' College, 1917; A. B., 1918.	

Assistants

CHRISTOPHER, W. N.	Assistant in Botany and Bacteriology
DAYLIS, F. T.	Student Assistant in Economics
HALL, WALTER J.	Assistant in Veterinary Science
D. V. M., New York State Veterinary College, Cornell University, 1921.	
JUMP, CECILE J.	Assistant in French
LOWE, BURDETTE H.	Assistant in Mathematics
B. S., Montana State College 1921.	
LUND, HELEN S.	Assistant in Art
B. S., Montana State College, 1918.	

EXPERIMENT STATION STAFF

LINFIELD, FREDERICK B.	Director
B. S. A., Ontario Agricultural College, 1891.	

Department Heads

ARNETT, CLARE NEWTON	Animal Husbandry
B. S. A., Purdue University, 1907.	
BOWDEN, RAY B.	Agricultural Editor
BURKE, EDMUND	Chemistry and Meteorology
B. S., Montana State College, 1907.	
COOLEY, ROBERT A.	Entomology
B. S., Massachusetts Agricultural College, 1895.	

CURRIER, EDWIN L.....	Farm Management
B. S., University of Nebraska, 1912.	
HAMILTON, JAMES M.....	Agricultural Economics
B. S., Union Christian College, 1887; M. S., 1890.	
HARRINGTON, FRANK M.....	Horticulture
B. S., Oregon Agricultural College, 1913; M. S., Iowa State College, 1921.	
McKEE, CLYDE.....	Agronomy
B. S., Kansas State Agricultural College, 1910.	
MURDOCK, HARVEY E.....	Agricultural Engineering
B. S., University of Colorado, 1906; M. E., 1908; C. E., 1911.	
SCHOPPE, WILLIAM F.....	Poultry
B. S., University of Maine, 1907; M. S., 1913.	
SWINGLE, DEANE B.....	Botany and Bacteriology
B. S., Kansas State Agricultural College, 1900; M. S., University of Wisconsin, 1901.	
WELCH, HOWARD.....	Veterinary
A. B., University of Missouri, 1902; B. S. A., 1906; D. V. M., Cornell University, 1909.	

Department Assistants

BARKER, JAMES R.....	Agricultural Engineering
B. S., Utah Agricultural College, 1921.	
*BLISH, MORRIS J.....	Chemistry
B. S., University of Nebraska, 1912; A. M., 1913; Ph. D., University of Minnesota, 1915.	
COOK, WILLIAM C.....	Entomology
B. S., Cornell University, 1917; M. S., University of Minnesota, 1920.	
GIESEKER, LEONARD F.....	Agronomy
B. S., University of Nebraska, 1908; M. S. A., Cornell University, 1914.	
HALL, WALTER J.....	Veterinary Science
D. V. M., New York State Veterinary College, Cornell University, 1921.	
HASKINS, MARY L.....	Publication Clerk
JONES, RAY S.....	Chemistry
B. S., Montana State College, 1915.	
JOSEPH, W. E.....	Animal Husbandry
B. S., Purdue University, 1907; Ph. D., University of Illinois, 1912.	
McCHORD, ROBERT C.....	Animal Husbandry
A. B., Central University, 1908; B. S. A., Iowa State College, 1913.	
MORRIS, HARRY E.....	Botany and Bacteriology
B. S., Montana State College, 1909; M. S., University of Wisconsin, 1917.	
NELSON, JOSEPH B.....	Agronomy

*Resigned March 1, 1922.

PARKER, JOHN R.....	Entomology
B. S., Massachusetts Agricultural College, 1908.	
PINCKNEY, REUBEN M.....	Chemistry
B. S., Nebraska Wesleyan University, 1906; A. M., University of Nebraska, 1908.	
POOL, GUSSIE.....	Botany and Bacteriology
B. S., Montana State College, 1921.	
PLUMB, C. W.....	Station Clerk
REGAN, W. S.....	Entomology
B. S., Massachusetts Agricultural College, 1908; Ph. D., 1915.	
SELBY, HALBERT E.....	Farm Management
B. S., Oregon Agricultural College, 1916.	
STARRING, CECIL C.....	Horticulture
B. S., South Dakota State College, 1911.	
SUMNER, HARLAN R.....	Agronomy
B. S. A., Kansas State Agricultural College, 1916; A. M., University of Missouri, 1917.	
TRETSEVEN, OSCAR.....	Animal Husbandry

Grain Laboratory

*DAY, W. FRIEND.....	Assistant Superintendent
WHITCOMB, WILLIAM O.....	Superintendent
B. S. A., North Dakota Agricultural College, 1909; M. S. A., Cornell University, 1913.	

SUBSTATION STAFF

Judith Basin Substation, Moccasin

LOSENBRUG, ALBERT	Superintendent
B. S., Montana State College, 1916.	

Northern Montana Substation, Havre

BAKER, ALFRED L.....	Assistant in Animal Husbandry
B. S., Montana State College, 1921.	
MORGAN, GEORGE W.....	Superintendent
B. S., Montana State College, 1912.	

Huntley Substation, Huntley

HANSEN, DAN.....	Superintendent
SEAMANS, ARTHUR E.....	Assistant Superintendent
B. S., Montana State College, 1913.	

*Resigned March 1, 1922.

Horticultural Substation, Corvallis

THORNER, HARVEYSuperintendent
B. S., Washington State College, 1911.

AGRICULTURAL EXTENSION STAFF

COOLEY, FRED S......Director
B. S., Massachusetts Agricultural College, 1888.

CAMPBELL, JOHN R......State Leader of Extension Schools
and Meetings
B. S. A., Iowa State College, 1909; M. S., 1911.

FERGUSON, BLAINEIrrigation Specialist
B. S., Oregon Agricultural College, 1913.

GRABER, MARY ANNFood Specialist
B. S., Ohio State University, 1915.

HAMPTON, SAMUEL J......Lecturer

JENNISON, HARRY M......Extension Botanist
B. S., Massachusetts Agricultural College, 1908; A. M., Wabash College, 1911.

LEE, BLANCHAssistant State Leader of Home
Demonstration Work
B. S., University of Minnesota, 1918.

LINHOFF, EMILY A......Assistant Club Leader
Stout Institute, 1915.

LOTT, ELMO HAMILTON.....Assistant State Leader of County Agents
B. S., Cornell College, 1912; B. S. A., Iowa State College, 1917.

MILAM, LOTTIEHome Management Specialist
B. S., Oregon Agricultural College, 1915; A. M., Columbia University, 1921.

MILLIN, RICHARD B......Livestock Specialist
B. S., University of Illinois, 1916.

OGAARD, ARTHUR J......Extension Agronomist
B. S., North Dakota Agricultural College, 1913.

OMAN, ARTHUR E......Biological Field Agent
M. S., Yale University, 1906.

PATCHIN, RUTHClothing Specialist
B. S., University of Minnesota, 1920.

POTTER, CHARLES E......State Leader of Boys' and Girls' Clubs
B. S., West Virginia University, 1919.

TAYLOR, JOHN C......State Leader of County Agents
B. S., Montana State College, 1912.

TURLEY, ANNA M......State Leader of Home Demonstration Work
B. S., Purdue University, 1911.

WILSON, MILBURN LINCOLNState Leader in Farm Economics
B. S. A. Iowa State College 1907; M. S., University of Wisconsin, 1920.

County Agricultural Agents

ANDERSON, ANDREW D.	Wheatland County, Harlowton
BODLEY, RALPH E.	Gallatin County, Bozeman
B. S., University of Nebraska, 1912.	
BROSSARD, HOWARD S.	Yellowstone County, Billings
B. S., Utah Agricultural College, 1916.	
CAMPBELL, LOUIS A.	Hill County, Havre
B. S., University of Minnesota, 1916.	
CARNEY, CHARLES E.	Ravalli County, Hamilton
B. S. A., University of Minnesota, 1921.	
CLARKSON, ROBERT E.	Teton County, Choteau
B. S., Montana State College, 1917.	
DEPUE, HAROLD F.	Richland County, Sidney
B. S., University of West Virginia, 1919.	
GUSTAFSON, GEORGE W.	Blaine County, Chinook
B. S. A., North Dakota Agricultural College, 1914.	
HEMBRE, J. O.	Fallon County, Baker
B. S. University of Wisconsin, 1916.	
*HILLMAN, FRANK M.	Sanders County, Thompson Falls
B. S., University of Minnesota, 1912.	
JONES, DAVID W., JR.	Chouteau County, Fort Benton
B. S. A., Utah Agricultural College, 1916.	
JONES, W. H.	Stillwater County, Columbus
B. S. A., West Virginia University, 1915.	
KAUFFMAN, H. N.	Madison County, Twin Bridges
A. B., Wittenberg College, 1911.	
LEWIS, GROVER E.	Prairie County, Terry
B. S., Utah Agricultural College, 1916.	
McKEE, R. B.	Flathead County, Kalispell
B. S., North Dakota Agricultural College, 1916.	
MACSPADDEN, F. E.	Cascade County, Great Falls
B. S., Montana State College, 1917.	
MANNING, J. W.	Lewis and Clark County, Helena
B. S., Montana State College, 1917.	
MENDENHALL, DEANE W.	Dawson County, Glendive
B. S., North Dakota Agricultural College, 1914.	
PETERSON, CARL H.	Fergus County, Lewistown
NOBLE, DANIEL B.	Roosevelt County, Poplar
B. S., Montana State College, 1919.	
RYMAN, L. B.	Big Horn County, Hardin
B. S., Iowa State College, 1920.	

*Resigned March 1, 1922.

STAPLETON, W. P.....	Phillips County, Malta
B. S. A., North Dakota Agricultural College, 1913.	
STEBBINS, MURRAY E.....	Valley County, Glasgow
B. S., North Dakota Agricultural College, 1916.	
THORFINNSEN, M. A.....	Sanders County, Thompson Falls
B. S. A., North Dakota Agricultural College, 1917.	
WAGNER, PAUL C.....	Rosebud County, Forsyth
YERRINGTON, C. M.....	Custer County, Miles City
B. S., North Dakota Agricultural College, 1914.	

Home Demonstration Agents

BORTHWICK, ALBERTA.....	Cascade County, Great Falls
B. S., Montana State College, 1916.	
ERICKSON, GERTRUDE	Valley County, Glasgow
FOSTER, INEZ	Yellowstone County, Billings
B. S., University of Minnesota, 1915.	
INGRAM, DORIS.....	Stillwater County, Columbus
B. S., Montana State College, 1919.	
MYERS, HAZEL.....	Rosebud County, Forsyth
B. S., Kansas Agricultural College, 1912.	
SNYDER, BESS I.....	Lewis and Clark County, Helena
B. S., Montana State College, 1920.	

County Club Leaders

EDER, MARTHA L.....	Big Horn County, Hardin
THOMAS, MAY	Fergus County Lewistown

FACULTY COMMITTEES

ATHLETICS:

Swingle, Graves, Sloan.

ELIGIBILITY OF ATHLETES:

Atkinson, Schoppe, Wilson.

FAIRS AND EXHIBITS:

Plew, Mrs. Hannon, Joseph, Wilson, Parker.

FRATERNITIES:

Hamilton, Mrs. Herrick, Arnett, Schoppe, Miss Gillespie.

GRADUATE STUDENTS:

Cooley, Norris, Arnett.

HEALTH:

Swingle, Graves, Holmes, Miss Branegan, Mrs. Herrick.

INSTRUCTION:

Cobleigh, Miss Branegan, Holst.

INTERSCHOLASTIC:

Jennison, Tallman, Wilson, Graves, Brewer, Plew.

LIBRARY:

Brewer, Joseph, Miss Franks, Cooley, Miss Brewer.

ADVANCED STANDING:

Conkling, Swingle, McKee, Schoppe.

NEW COURSES:

Ham, Tallman, Brewer.

PUBLICATIONS:

Brewer, Wilson, Bowden.

PUBLIC EXERCISES:

Atkinson, Mrs. Herrick, Howard.

REGISTRATION:

Wilson, Miss Brewer, Tallman.

SCHOLARSHIP AND STUDENT ATTENDANCE:

Conkling, Ham, Mrs. Herrick, Hamilton, Schoppe.

SERVICE:

Brewer, Abbey, Burke.

STUDENT SOCIAL AFFAIRS:

Mrs. Herrick, Wilson, Hamilton, Spaulding.

STUDENT LOANS:

Linfield, Mrs. Herrick, Norris, Hamilton, Cameron.

University of Montana

HISTORICAL SKETCH

An Act of Congress approved February 18, 1881, dedicated for university purposes in Montana, seventy-two sections of the public domain. The Enabling Act, providing for the organization of the State of Montana and its admission to the Union, February 22, 1889, confirmed this grant to the State and added one hundred thousand acres for a school of mines, one hundred thousand acres for normal schools, and one hundred and forty thousand acres for an agricultural college.

The Third Legislative Assembly of the State of Montana, in February, 1893, enacted laws providing for the establishment of all these institutions, and locating the State University at Missoula, the State School of Mines at Butte, the State Normal College at Dillon, and the State Agricultural College at Bozeman.

As the lands granted for higher educational purposes, together with timber or stone thereon, have been sold, the proceeds have gone into permanent funds invested for the various institutions, and the interest on these funds together with the rentals of sold lands, have been used for the support of the respective institutions. These maintenance resources have been supplemented with appropriations made each subsequent biennium by the Legislative Assembly, which has also provided for the erection of buildings at the expense of the State.

At the general election in November, 1920, the voters of the state, by a large majority, enacted, through the popular initiative, two measures for the financial support and development of the University of Montana. The first of these measures levies a tax of one and one-half mills on all the taxable property in the state annually for ten years for the maintenance of the University of Montana; the second provides for a state bond issue, from the proceeds of which three and three-quarters million dollars become available for the erection and equipment of buildings at the several institutions of the University of Montana.

These institutions were administered independently by local executive boards for some years under the general supervision of the State Board of Education; by a law of 1909 the powers of the local boards were more closely defined and the direction of the

State Board of Education made more effective. By the enactment of Chapter 92 of the Laws of the Thirteenth Legislative Assembly in 1913 the four institutions were combined into the University of Montana under the executive control of an officer whose title is Chancellor. In October, 1915, the State Board of Education appointed Edward C. Elliott, then of the University of Wisconsin as the first Chancellor of the University of Montana. He assumed his duties February 1, 1916.

Montana State College

HISTORICAL SKETCH

By an Act of the Third Legislative Assembly of Montana, signed by Governor J. E. Rickards, February 16, 1893, the Agricultural College of the State of Montana was located at Bozeman. This Act provided for an Executive Board which should have the immediate control and direction of the affairs of the College, subject only to the general supervision of the State Board of Education. The Executive Board was authorized to appoint a secretary and treasurer and to choose a president and faculty.

On March 21, 1893, the State Board of Education held its first meeting at Bozeman. A site of forty acres for campus was donated by Nelson Story, Sr. An adjoining one hundred and sixty acres of land, owned by Gallatin county, was donated, one-half by the county and one-half by the citizens of Bozeman. An Executive Board was appointed. The Executive Board chose Luther Foster for Acting President. On April 17, with the president and an assistant, instruction was begun. September 15, the College opened for its first full year's work. A. M. Ryon was president and the faculty numbered six. Courses were offered in agriculture, domestic economy, and applied science, the last being chiefly engineering and chemistry. There was also established a one-year preparatory course, a two-years business course, modeled after the usual private business college, and a music department.

Nelson Story, Sr., donated the use of a frame building which had been occupied as a Presbyterian Academy. The public school board allowed the use of some rooms in a nearby school building. During the summer of 1894, the brick veneer building now used for biology was erected out of the Hatch Experiment Station Fund.

The Legislative Assembly in 1895 authorized a bond issue of \$100,000 to provide funds to erect and furnish buildings for the college.

The Enabling Act, providing for the admission of Montana into the Union, approved February 22, 1889, Section 16 grants ninety thousand acres of land to Montana for the use and support of an agricultural college, according to the terms of the Act of Congress, the same purpose and subject to the same conditions and limita-

tions as the other grant. The one hundred and forty thousand acres of land cannot be sold for a price less than ten dollars per acre and the principal, together with all money received from the sale of timber, is to be invested as a permanent endowment. The unsold land may be leased, and the rental, together with the interest on the permanent endowment, shall be used for the maintenance of the college.

The Act of Congress of August 30, 1890, appropriated twenty-five thousand dollars annually out of the treasury of the United States. By the Nelson Bill, passed March 3, 1907, this amount was increased annually by five thousand dollars each year, beginning in 1907, until now the total annual appropriation has reached fifty thousand dollars, at which figure it is to remain.

The Smith-Hughes Act of Congress, February, 1917, provides a plan for vocational education in agriculture, home economics and trades and industries. To carry out the provisions of this Act, annual appropriations are made by both federal and state governments and the teacher training in agriculture and home economics is carried on by the college.

PURPOSE AND SCOPE.

The purpose of the college of agriculture and mechanic arts is chiefly to provide collegiate education in agriculture, engineering, home economics, applied art, secretarial studies and applied science, for the young men and women of the respective states in which they are located. The scope of the Montana State College is set forth in the two so-called Morrill Acts of Congress, which authorized this class of institutions and supplied in part endowment and funds for maintenance; and in the act of the Montana Legislature accepting the land and money grants from the national government.

The first Morrill Act of Congress of July 2, 1862, making a land grant for the partial endowment of the agricultural and mechanical colleges, states that the income from these lands shall be used to maintain colleges "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The second Morrill Act of Congress, August 30, 1890, making an annual appropriation out of the treasury of the United States for further support and endowment of these colleges, provides that this fund is "to be applied only to instruction in agriculture

and mechanic arts, the English language, and the various branches of mathematical, physical, natural and economic sciences, with special reference to their application to the industries of life; and to the facilities for such instruction."

The Act of the Montana Legislature, approved February 16, 1893, accepts these grants of land and money and provides that the Montana State College shall have for its object "instruction and education in the English language, literature and mathematics, civil and mechanical engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology and such other natural sciences as may be prescribed by the State Board of Education; political, rural and household economy, agriculture, horticulture, history, bookkeeping, and especially the application of science and the mechanical arts to practical agriculture in the field, and irrigation and the use of water for agricultural purposes."

THE COLLEGE CAMPUS AND FARM

The college grounds and farm contain four hundred fifty-five acres. Ninety-five acres of this constitutes the college campus, buildings, recreation grounds, lawn, driveways, flower beds and shrubbery. Three hundred and sixty acres remaining are utilized for farming and experiment station purposes.

BUILDINGS

During the last half of the coming college year the congested conditions in classrooms and laboratories will be somewhat relieved by the completion of four new buildings and a heating plant, all of which are now under construction.

Montana Hall is a three-story brick structure, situated in the center of the campus. It contains the administrative offices, library, assembly room, and departments of English, mathematics, physics, history, music, and applied art.

In the agricultural building are located the offices, classrooms, and laboratories for the departments of agronomy, horticulture, dairying, animal husbandry, and agricultural education. The second floor is used for the work in home economics, where are provided modern facilities for work in cooking, sewing, and household management. The offices and rooms used by the agricultural experiment station and the extension service are also at present located in this building.

For engineering there is under construction, just east of the present engineering group, a modern five-story fireproof building, 190 by 78 feet, which, when completed, will be one of the finest

buildings for this purpose in the northwest. The ground and first floor will be used by the civil and mechanical engineering departments, the second floor by the electrical engineering department, and the top floor by the department of architectural engineering. At present, engineering is carried on in a group of buildings located just back of Montana Hall.

There is also under construction, just south of the new engineering building, a laboratory and shops building, 182 by 119 feet, which in some measure relieves the present deficiencies in the engineering laboratories. This is only part of a completed structure twice this size.

Contracts have been let for a new and modern heating plant situated on the south side of the campus immediately south of the new shop building. It is equipped with two 350 horsepower Sterling boilers, Reily stokers, and modern coal handling and weighing machinery. The location of this plant near the engineering group makes it available for the instruction of engineering students.

There is under construction just east of the present biology building a new building to be known as Lewis Hall. It is a modern five-story brick building 129 by 67 feet, and contains almost one hundred rooms. These rooms will be used for housing the departments of entomology-zoology and botany-bacteriology for both college and experiment station activities. This building will furnish adequate facilities for the fine laboratory work necessary in these departments, and space on the top floor for a museum collection of the animal life of Montana. The headquarters of the college nurse is also located in this building.

The chemistry building is a modern fireproof building, completed in 1919. It is large enough to meet all the requirements of the students in chemistry, and since the building previously used for chemistry was destroyed by fire, all the furniture, apparatus and equipment are new. This building is also used in caring for the experiment station department of chemistry.

The department of military science and tactics is housed in a large frame structure in the northwest corner of the campus. This building was formerly used by the Students Army Training Corps. Immediately south is another building of the same size and construction, which has been remodeled to care adequately for instruction in agricultural engineering.

The new gymnasium, which is well under way and is expected to be ready for use at the beginning of the next college year, is located immediately south of the main building well toward the rear of the campus. It is a modern fireproof building, 163 by 99 feet, intended to serve the needs of both students and faculty. The basement floor contains four handball courts, plunge, and an indoor

tanbark field. The second floor contains locker rooms, showers for both men and women, together with offices and rest rooms. The third story contains the main gymnasium floor, 128 by 83 feet, and an auxiliary gymnasium 56 by 66 feet, and another handball court.

Hamilton Hall, just east of Montana Hall, is the residence hall for women on the campus. It was constructed in 1911, and has facilities for sixty people.

In addition to these buildings, there are located with the agricultural group a veterinary building, a poultry plant, modern barns for the different classes of livestock, grain storage rooms for crop-study, and modern storage facilities for horticulture and farm products.

COLLEGE SURROUNDINGS

Bozeman, the county seat of Gallatin county, is on the main line of the Northern Pacific railroad, and on a branch of the Chicago, Milwaukee & St. Paul railroad. For convenience, healthfulness and beauty of surrounding the location is unsurpassed. The college is situated on an elevation which commands a view of one of the most fertile valleys in the world, covered far and wide with grain fields, and surrounded on all sides by lofty mountains.

Bozeman is a city of homes and churches, with a wholesome moral environment. It is a most desirable residence city for families who wish to educate their children. The college is reached from the railroad station and city by an electric car line.

EXPENSES OF STUDENTS

BOARD AND ROOM FOR MEN

Since January, 1919, the barracks built by the State and Federal government for the accommodation of the Students' Army Training Corps have been used as living quarters and dining room for men students. The future policy governing the use of these buildings will depend on the demands for teaching space. If living quarters for men are to be maintained in the future announcement will be made.

Fraternity houses are maintained by students which accommodate a number for board and room. Students may find room and board in private families convenient to the college, for \$35 to \$40 per month. The total college expenses for the year, including fees, books, room, board and incidental expenses, may be estimated from

\$400 to \$500. A list of approved places with prices and accommodations is kept in the registrar's office. A committee of students meets all trains on registration days and at other times on request, and aids in finding satisfactory locations.

BOARD AND ROOM FOR WOMEN

Hamilton Hall is the college home for women. The Hall is under the supervision of the house director, and the residents have the care and training necessary for a family of students. The price of rooms (including board) varies according to the location and size of room. Because of the unusual fluctuation of food costs the following prices are subject to change at any time during the year:

One in single room	\$36.00
Two in single room (each)	\$34.50
Two in double room (each)	\$35.00
Two en suite (each)	\$38.00
Three en suite (each)	\$36.00

The above prices are for a calendar month. Application for rooms in the hall may be made at any time to the house director, and must always be accompanied by a deposit of \$5.00 to insure reservation. This amount will be returned if the house director is notified before September 26th, or will be deposited until the room is vacated. When a room is vacated if, in the judgment of the house director, the room and furniture have not been injured more than could be expected from the ordinary wear and tear, the \$5.00 will be refunded. If either the room or the furniture has been injured more than would be due to ordinary wear and tear, such portion of the \$5.00 will be retained by the institution as may be needed to make good the damage. All freshmen women entering the institution are required to live in Hamilton Hall for the entire college year. All other women reserving rooms in Hamilton Hall will be expected to continue residence for the entire college year unless they withdraw from the institution. Residents who leave the Hall before the close of the quarter will be required to pay the room rent till the end of the quarter. Payment for room and board must be made on the fifteenth of every month in advance, and after five days thereafter an extra charge of \$1.00 per week will be made as long as the bill remains unpaid, unless arrangements have been made to defer payment. Complete arrangements are made for the reception of the residents the day before registration day, and no deduction will be made for late arrivals. The Hall will not be open for occupancy until the day before registration day. No deduction is made for absence at week-ends or during vacations, except the Christmas holidays, when room rent only will

be paid. The residents may have guests at meals by making arrangements for same at the house director's office the day before, and may also have the privilege of the laundry by paying a small fee. The residents are expected to furnish their own towel supply, dresser and table scarfs, and have them laundered; also white scrim curtains, a napkin ring, and any room decorations they may fancy.

RAILROAD FARE REFUNDS

In accordance with the provisions of Chapter 123 of the Session Laws of 1917, enacted by the Fifteenth Legislative Assembly, and under regulations established by the State Board of Education, railroad fare in excess of five dollars actually paid by any student for a round trip between his Montana home and any institution of the University of Montana once each year, will be refunded.

FEES AND DEPOSITS.

A fee is a fixed charge, no part of which is returnable except as specified under refunds. A deposit is intended to serve as a security against losses and breakage. Any unused balances are returnable up to thirty days after the close of the academic year. If not then withdrawn, they are forfeited.

Registration Fee\$10.00

Payable annually in advance by each college student in attendance during the autumn, winter, or spring quarter. In no case will any part of the fee be refunded.

Short Course Registration Fee.....\$ 6.00

Payable annually in advance by each student in the School of Agriculture. In no case will any part of this fee be refunded.

Registration Fee, Summer Quarter.....\$10.00

Payable in advance by all students attending the summer quarter. In no case will any part of this fee be refunded.

Associated Students Activity Fee.....\$10.00

Payable annually in advance by all college students entering the autumn quarter. Students entering at the beginning of the winter quarter pay \$7.50 and at the beginning of the spring quarter \$5.00.

Associated Short Course Students Activity Fee.....	\$ 5.00
Payable annually in advance by each student in the School of Agriculture. Students entering the winter quarter pay \$2.50 per quarter.	
Late Registration Fee, during the first week of the Quarter....	\$ 2.00
Payable by students registering after the prescribed registration days of any quarter, except students entering for the first time.	
Fee for Removing Conditions	\$ 2.00
Payable by students who take condition examinations at times not regularly designated in the calendar.	
Limited Registration Fee, each course, per quarter.....	\$ 2.00
Payable by special students registering for not more than two courses. The total credits for the courses shall not exceed six.	
Special Attendance Fee, each course, per quarter.....	\$ 2.00
Payable by adults not regularly registered but attending classes as listeners.	
Library Deposit	\$ 3.00
Payable by all students.	
Hospital Fee, per quarter.....	\$ 2.00
Payable by all students.	

Note—The following fees and deposits are given per quarter:

Number of Course	Fee	Deposit
Agricultural Engineering: 101, 301, 303, 304, c, d, f, i 2	\$2.00	\$2.00
Agricultural Engineering: g, i 4	3.00	2.00
Agronomy: 200, 201, 202	1.00	1.00
Agronomy: 300	1.00	.00
Animal Husbandry: 101, 102, 201, 202, 301, 304, 310, a, b, c, j,	1.00	.00
Animal Husbandry: 303, e, f, i, k	2.00	.00
Applied Art: 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 200, 201, 202, 203, 204, 205, 206, 207, 208, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414; .....	.50	.00
Applied Art: 311, 421, 422	3.00	.00
Applied Art: 418, 419, 420	1.00	to 5.00 .00
Botany and Bacteriology: a	1.00	.00
Botany and Bacteriology: 100	2.00	2.00

Number of Course	Fee	Deposit
Botany and Bacteriology: 101, 301, 400	3.00	.00
Botany and Bacteriology: 200, 302	4.00	2.00
Botany and Bacteriology: 201	4.00	3.00
Botany and Bacteriology: 203, 204	4.00	4.00
Botany and Bacteriology: 300	3.00	3.00
Botany and Bacteriology: 401	4.00	5.00
Botany and Bacteriology: 403	1.00	4.00
Chemistry: 101, 102, 103, 203, 204, 205, 207, 209, 301, 302, 303, 310, 311, 312, 313, 321, 323, 330, 331, 401, 402, 403, 414, 415, a,	4.00	4.00
Chemistry: 208	6.00	4.00
Chemistry: 427	2.00	2.00
Civil Engineering: 101, 102, 103, 104, 201, 202, 203, 340, 350, 351, 362	1.00	2.00
Civil Engineering: 321, 331, 346	2.00	2.00
Civil Engineering: 343, 344 .....	.00	2.00
Dairy Husbandry: 200, 201, 300, a, b, c, d	2.00	1.00
Electrical Engineering: 321, 322, 323, 353, 421, 422, 423	1.00	5.00
Entomology and Zoology: 100, 101, 200, 201, 300, 301	3.00	.00
Entomology and Zoology: 202, 203, 204, 304, 305, 400	2.00	.00
Entomology and Zoology: 401.....	2.00 to 10.00	.00
Geology: 301	4.00	4.00
Home Economics: 100, 101, 200, 201	2.50	.00
Home Economics: 103, 104, 107, 108, 202, 304, 313, 403	2.00	.00
Home Economics: 106, 312	1.50	.00
Home Economics: 300, 400, 404	4.00	.00
Home Economics: 302, 309, 311	1.00	.00
Home Economics: 401 .....	.50	.00
Home Economics: 402 .....	.50 to 6.00	.00
Horticulture: 100, 305	1.00	1.00
Horticulture: 300	5.00	.00
Horticulture: 302, 101, 306, 307, 308, a	1.00	.00
Mechanical Engineering: 101, 102, 103, 201, 202, 203, 301, 302, 303	2.00	2.00
Mechanical Engineering: 341, 342, 343, 345, 441..	2.00	.00
Physics: 204, 207, 208, 209, 214, 215, 221, 301, 302, 305, 309	1.00	1.00
Poultry Husbandry: 301, 302	1.00	.00
Secretarial Work: 103, 104, 105, 203, 204, 205.....	1.00	.00
Veterinary Science: 301	2.00	.00

MUSIC**Piano, Violin, Voice**

	Fees
One half-hour lesson per week.....	\$18.00
Two half-hour lessons per week.....	33.00
Ensemble playing	7.00
Harmony and Theory	10.00
Piano, rent one hour per day.....	4.00
Piano rent, each additional hour per day.....	3.00

Dormitory Room and Board

Women's Dormitory Room and Board, a month.....	\$35.00 to \$38.00
Depending on room.	

REFUND OF FEES

Refundable fees and deposits must be claimed within thirty days after the close of the quarter for which they were paid; otherwise they will be forfeited.

Registration Fees:

Registration fees, (including summer quarter registration, late registration, limited registration, and special attendance fees), will not be refunded under any circumstances.

Associated Students Activity Fees:

Students who have entered the autumn quarter and paid the annual associated student activity fees will receive a refund of one-half the amount paid if they leave at or before the close of the autumn quarter. There will be no refund on account of withdrawals after the opening of the winter quarter.

Music Fees:

When music students withdraw before the end of the quarter, \$1.50 will be retained for each lesson period up to the time of withdrawal, and any balance remaining will be refunded.

No piano rentals will be refunded.

Laboratory Fees:

Students withdrawing by the beginning of the second week of any quarter will receive a refund of 90% of the laboratory fees paid for the quarter. Those withdrawing by the beginning of the seventh week will receive a refund of 40% of the laboratory fees paid for the quarter.

REQUIREMENTS FOR ADMISSION

Applicants for admission must be at least sixteen years of age and must present evidence of good moral character.

The completion of a high school or preparatory course of four years is the standard for regular entrance. This must include at least fifteen units of work. A unit is the amount of work represented by the successful completion of one subject pursued for a school year of not less than thirty-six weeks, with five recitations per week, each recitation period being not less than forty-five minutes net. Two periods of laboratory, shop or drawing work count as one recitation. The required units must include three units in English composition and literature and one in American history and government. Students are advised to include also two units in mathematics and one in science.

Admission without condition to the courses in engineering requires three years of mathematics and one year of physics.

Candidates for admission to the school of agriculture must have completed the eighth grade in the public schools or its equivalent.

ADMISSION ON CERTIFICATES

Graduates of any Montana high school or academy fully accredited by the State Board of Education, or of any high school or academy in another state accredited by the North Central Association, are admitted to regular standing by the presentation of an official certificate of graduation. Blanks for such certification are furnished by the registrar. They should be secured from him, filled out, and filed in the registrar's office on or before the first day of registration.

Graduates of any other secondary schools outside of Montana are admitted on the presentation of an official certificate of graduation, if the schools maintain, on the basis of regular inspection, accredited relationship with the state university or other university within the state included in the membership of the Association of American Universities.

ADMISSION ON EXAMINATION

Any other person must, in order to be admitted to regular standing, pass a satisfactory examination on not less than fifteen units* of secondary school work; provided, that any graduate of a Montana high school accredited by the State Board of Education for the work

*These fifteen units must include three units of English composition and literature and one unit of American history and government. No less than one full unit in any subject will be accepted, and a student offering foreign language as part of his preparation must present at least two units in one language.

of only one, two, or three years, may receive entrance credits without examination upon such work as has been successfully completed in such accredited courses, as shown by official certificates.

Those who expect to take entrance examinations should notify the registrar in advance, stating what subjects they desire to offer by examination. For the academic year 1922-'23 the examination days are September 26 and 27, and for the winter and spring quarters by special arrangement.

CONDITIONAL ADMISSION

The entrance requirement of graduation from a four years accredited high school course, including at least fifteen units of credit, may be modified in individual cases by permitting the conditional admission of a student if he has at least fifteen entrance units and has been in regular attendance in a fully accredited high school for four years. To acquire regular standing such a student must present a total of fifteen entrance units. He must make up the number lacking within one year from the date of his first registration.

ADMISSION OF SPECIAL STUDENTS

Students of twenty-one years of age or over, not candidates for degrees, may be admitted without the usual entrance units, as special students, if they give satisfactory evidence that they are prepared to pursue successfully the special courses desired. Special students may acquire status as regular students upon complying with the rules applicable to such cases.

ADMISSION BY TRANSFER FROM OTHER COLLEGES AND UNIVERSITIES

Students from other colleges and universities of recognized standing will be admitted without condition on presentation of certificates from such college or university that they have completed the required fifteen entrance units and have an honorable dismissal.

Credit will be given for work of collegiate grade done in other institutions of approved standing. Graduates of an approved two years normal course requiring fifteen units for entrance will be admitted to junior standing. Graduates of the Montana State Normal College who have earned credits after the completion of the two years course will be given hour-for-hour credit in subjects of university or college character up to a maximum of forty-five credits.

A student suspended or dropped at one of the other institutions of the University of Montana will not be admitted without the approval of the president of the institution by which he was suspended or dropped.

REQUIREMENTS FOR GRADUATION

Bachelor's Degree—Candidates for the bachelor's degree must complete satisfactorily one of the college courses. Students who are relieved for any reason of the requirements in military science or physical education shall present six additional credits in some other subjects.

In order to complete a course satisfactorily and receive a degree a student must earn as many points as there are credits in the course. In calculating points A grades count three times as many points as credits allowed for the subject, B grades twice as many points, C grades count the same number of points as credits, and D grades count nothing toward graduation.

All students whose points are two and one-fourth times the number of credits at the time of graduation will receive the degree "With Honors."

For convenience in estimating the requirements for a degree, the following rules are laid down: One hour a week, for a quarter of recitation or lecture work, two or two and one-half hours a week for a quarter of laboratory, shop, library work, or drawing, shall count as one credit.

Attention is called to the fact that on October 1, 1917, the definition of the term credit was changed, by the transfer to the quarterly instead of the semester calendar. The new credit in time value counts just two-thirds as much as the old. Students who received credit on the books prior to October 1, 1917, in computing their standing by the present system should add fifty per cent to the number of credit and points.

If for any reason the full time is not occupied in the shop, laboratory, drawing room or library, the remainder shall be used under the supervision of the instructor for outside work.

No regular student may take in any one quarter, work amounting to less than twelve credits, nor more than nineteen, unless a greater number are prescribed in the course.

ADVANCED DEGREES

Master's Degree—The Master of Science degree is conferred in the following departments: Botany and bacteriology, chemistry, entomology and zoology. To become a candidate the student must hold a bachelor's degree from the University of Montana or from another institution of equal rank approved by the committee on graduate studies of the State College of Agriculture and Mechanic Arts. The candidate will be required to meet the following conditions:

1. The candidate shall name the particular branch of science in which he hopes to receive the degree and present evidence of sufficient preparation in this branch.

2. One full year or three-quarters of residence study amounting to at least forty-five credits of work is required.

3. There shall be a major subject and one or two minor subjects and at least one-half of the work must be done in the major subjects.

4. The major work shall be in advance of all undergraduate courses of the college but the minor subjects may be selected from among courses pursued for the bachelor's degree. The minor subjects shall be approved in advance by the committee on graduate studies.

5. The head of the department in which the major work is selected shall be the candidate's class adviser.

6. With the aid of the adviser, the candidate shall prepare and submit in writing to the committee on graduate studies, not later than the second week of his resident study, a program of the work which he intends to do as a candidate for this degree. The committee will thereupon report to the candidate and the faculty its action on the candidacy.

7. The candidate shall present a thesis, which shall be a part of his major work.

8. The candidate will offer himself for examination in his major and minor studies. This examination will be under the supervision of the committee on graduate studies and may be oral or in writing. This committee will appoint a special examining committee.

Graduate students are required to pay the regular matriculation fee and all course fees. They will not, however, be expected to pay the student activity fee.

Engineering Degrees—The professional engineering degrees, Architectural Engineer, Chemical Engineer, Civil Engineer, Electrical Engineer, and Mechanical Engineer will be conferred on graduates who present satisfactory evidence of professional work of superior quality extending over a period of not less than three years in the same branch of engineering as that in which the advanced degree is desired. Candidates for these degrees will be required to meet the following conditions:

1. The candidate shall submit a record of his professional experience and the subject of his thesis to the committee on graduate studies for their approval not later than January first preceding commencement.

2. The candidate shall present a bachelor's degree in engineering from an institution of recognized standing.
 3. The candidate shall present a satisfactory thesis.
 4. The candidate shall offer himself for examination before a committee of the faculty, which shall be appointed by the committee on graduate studies.
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REGISTRATION

Time for Registration—The time set for registration of students during the three-quarters of the college year is as follows: For the autumn quarter, the first two days. Students in attendance during the autumn quarter will register for the winter quarter during the last three days of the autumn quarter. Students entering the institution for the first time at the beginning of the winter quarter will register on the first day of that quarter. Students in attendance during the winter quarter will register for the spring quarter during the last three days of the winter quarter. Students entering the institution for the first time at the beginning of the spring quarter will register on the first day of that quarter. The class room work begins the first day following registration day. Students will not be registered on days not listed for registration, except at the convenience of the class advisers between four and five in the afternoon. Those who fail to present themselves for registration on the days designated for registration in any quarter, will be permitted to register later in the first week, only upon the payment of a special fee of \$2.00 in addition to the regular fees.

Change of Registration—A student desiring to change his studies will present his request to his class adviser, who, after consulting all teachers interested, will take such action as he may deem best. A change in course of study is allowed only on the approval of the student's class adviser and the registration committee.

Registration by Mail—Most of the details of registration can be arranged in advance by mail, and students are requested to arrange their work so far as possible in this way. Those who enter the institution for the first time should write several days in advance of the college opening enclosing their credentials to the registrar of the college and should state the work which they wish to take. These documents will be examined and the student's classification will ordinarily be determined before his arrival so that much time in registration may be saved. Those who have already been enrolled in the institution should send a letter to their class adviser several days

in advance of the registration days stating clearly the work which they plan to take and in case of elective subjects stating briefly the reasons for their choice.

If these steps are taken by students registration should be completed with a minimum expenditure of time; but no student's registration will be complete until he applies at the college in person.

Students who plan to arrange their registration by mail as specified above should study carefully the entrance requirements for the courses in which they are interested and the prerequisites to the various subjects which they wish to take.

SCHOLARSHIP AND ATTENDANCE

Government—The college requires all students to conform to the usual standards of society and law-abiding citizenship and to manifest a serious purpose by maintaining satisfactory standing in the courses which they undertake. No student will be permitted to continue his connection with the university who shows persistent unwillingness or inability to comply with these requirements.

Leave of Absence—When it is necessary for a student to be absent from the city, application must be made to the president for leave of absence. A leave of absence is justification for absence from class, but does not give relief from the work omitted.

Honorable Dismissal—Students intending to sever their connection with the institution, either indefinitely or permanently, should report as soon as possible to the president either in person or writing, giving proper explanation, and should apply for an honorable dismissal. Students leaving the institution without such honorable dismissal (except at the end of a quarter), will not be readmitted to the college at any later time, nor will any report of grades in credit for work done here be sent out until satisfactory explanation is made.

Passing Grades—Passing grades are marked A, B, C, or D. An average standing from 90 to 100 is A, from 80 to 90 is B, from 70 to 80 is C, and from 60 to 70 is D.

Conditions and Failures—Work not of a passing grade is marked E, if in the judgment of the instructor it can be made up or completed without repeating the course in class. Work not of a passing grade is marked F, if in the judgment of the instructor it cannot be made up or completed without repeating the course in class. A mark of E is condition and may be removed by an examination or in such other manner as the instructor may prescribe. Examinations for removing conditions are held on the days designated in the college

calendar. A mark of F is a failure and must be made up by repeating the subject in class. When a condition is not removed by the time the subject is offered the following year it lapses into a failure. The above marks apply to laboratory, shop work, drawing and other exercises, as well as to lecture and recitation courses.

Scholarship—The names of students making grades of D, E, and F are reported to the registrar's office at intervals approximately six weeks apart, as indicated in the college calendar. Names of delinquent students are then reported to the scholarship committee, who immediately advise these students of their delinquencies. It is the sense of the faculty that students not passing in ten credits are wasting their time and the students and their parents are notified by the scholarship committee that if the students are not passing in ten credits at the next report on the standing of students they are to be recommended to the faculty for dismissal. The report on regular quarterly examinations is considered the same as any other report on standings, and students who fail at the end of any quarter to pass in ten credits must be passing at the time of the first report in the following quarter.

The names of the delinquent students are sent to the chancellor, president, registrar, and class advisers concerned.

A student placed on probation by the scholarship committee loses all rights and privileges of membership in all student organizations and activities. This rule does not apply to membership in a fraternity or sorority where the student placed on probation is a duly initiated member of such fraternity or sorority.

A student on probation shall not be absent from scheduled college exercises unless ill and attended by a regular physician or the college nurse.

No leave of absence is granted a student on probation except upon a written request from the parent or guardian.

Absences—Students absent from required exercises are reported at the close of each day to the registrar's office. On each Monday morning there are posted on bulletin boards the names of those students who are to appear before the absence committee. The committee, or one of its number, may be found each Monday afternoon at four o'clock in the office of the registrar, and deals with the cases of students whose names have been listed for consideration. In the case of frequent unwarranted absences, the committee brings the case before the faculty for discipline. These regulations apply to all students in the institution below the grade of junior.

Class absences of juniors and seniors are not reported until the instructor thinks that members of these classes are wilfully remaining away from class and so wasting their time, and then these

are reported to the absence committee for consideration and to the faculty for discipline. The instructors deal with tardiness in such manner as they deem best.

Assembly—Students are required to attend the assemblies held on each Friday during the college year, and all special assemblies. The programs of these assemblies consist of addresses, music recitals, illustrated lectures, etc.

MISCELLANEOUS INFORMATION

EMPLOYMENT AND AID FOR STUDENTS

A number of students earn a part of their expenses while in college. Students expecting to work their way should come with sufficient money to pay their expenses for one quarter unless they have engaged work in advance. The college cannot guarantee employment, but those who are willing to give efficient, faithful service have usually found work.

A few students are employed as janitors and assistants in the shops, laboratories and barns. Others care for furnaces, work in stores and at various kinds of house work. Calls for young women students to work for their board and room are numerous.

Students readily find employment at profitable wages during the summer vacation.

Engineering students are placed with the reclamation service, the railroads, and the electric power plants.

RESERVE OFFICERS' TRAINING CORPS

The State College has been designated by the war department as one of the institutions for higher education where provision will be made for the maintenance of a Reserve Officers' Training Corps. The course outlined for this corps is entirely different from that of the S. A. T. C. It is practically the plan for military instruction which was in effect before the war. It includes a course in military drill and one in military science; it is required of freshmen and sophomores and is elective with juniors and seniors. Those who carry this course for four years are accepted as second lieutenants in the United States army for six months; if, at the end of that period, they elect to remain permanently in the army, they will receive commissions. Certain allowances for maintenance are made to juniors and seniors; freshmen and sophomores are supplied with uniforms. The time required for this course is two hours a week.

REQUIREMENTS FOR CERTIFICATE OF QUALIFICATION TO TEACH

In order to teach in any of the schools in Montana, graduates of the Montana State College must secure the Certificate of Qualification to Teach. The requirements to obtain such certificate are as follows:

Psychology	Three credits
Educational Psychology	Three credits
Theory and Practice	Three credits
Teaching Practice	Three credits

Six additional credits in education must be selected from courses in general education, agricultural education, trade and industry education, or home economics education, the selection to depend upon the kind of work the student will teach after graduation.

INTERDENOMINATIONAL STUDENT PASTOR

Three of the churches, viz., the Baptist, Methodist Episcopal, and Presbyterian, are cooperatively maintaining a student pastor, Rev. C. B. Stephens, whose entire time is devoted to the religious life of the students. He is attempting in connection with the local churches to foster a united Christian program that offers extensive opportunities to all students for religious culture and service. He invites parents, pastors, teachers, and students to maintain the closest contact with him.

STUDENT ORGANIZATIONS

YOUNG WOMEN'S CHRISTIAN ASSOCIATION

The object of this association is the symmetrical development of Christian womanhood and the rendering of social service. To this end it conducts devotional meetings, Bible and mission study classes, and carries on an employment bureau for college women; homes are found where college women may receive their board and room in return for their services. This work has been standardized and is supervised by the home economics seniors of the Y. W. C. A. The Y. W. C. A. sends delegates to the Northwest Conference and keeps in touch with the state, national and international associations.

DEBATING

The management of the work in inter-class and intercollegiate debating, in extemporaneous speaking, and in oratory, is now vested in the manager appointed by the Associated Students, and the Pi Kappa Delta, which works in co-operation with the department of English. There is an established debate each year between the freshman and sophomore classes. There are state contests in oratory and extemporaneous addresses and several intercollegiate debates.

THE EXPONENT

The students of the college maintain a weekly paper, The Exponent. The paper is well supported by the students and advertisers, and is one of the most important student enterprises. It affords the members of the staff very valuable literary training.

ATHLETIC COUNCIL

This organization, composed of representatives from the faculty, alumni association and student body, has general control over all branches of athletics. Football, basketball, baseball, track and tennis are at present recognized.

BRANCH OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

A branch of this society is maintained at the college. Regular monthly meetings are held at which original papers are read or those of the Institute discussed. Students and teachers are kept in touch with practical engineers and their problems. Only regular members or student members of the American Institute are eligible to membership in this branch. There is, however, an Electrical club, which includes all the members of the Institute and all other students in the electrical engineering course.

BRANCH OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

The mechanical engineering students have a student engineering society affiliated with the American Society of Mechanical Engineers. Monthly meetings are held at which technical papers are presented by student members or by prominent mechanical engineers. All mechanical engineering students are eligible to membership.

THE CIVIL ENGINEERING SOCIETY

The students of the department of civil engineering organized this society for the purpose of promoting their interests in matters of practical importance to engineering students and the alumni. Prominent engineers who have succeeded in special fields frequently meet with the members of the society to discuss the problems of their field.

COLLEGE BAND

The college band is one of the best amateur musical organizations in the state. The college provides instruments, music and instruction. The band is divided into two sections, beginners and experienced players. This gives a splendid opportunity for those who have never played and those who have some skill in the use of instruments. One-half credit per quarter is allowed for those who register in band.

GLEE CLUB

Men are admitted upon examination as to musical qualifications, and the membership is limited to about sixteen. Instruction and music are furnished free by the music department. Both popular and high-class works are studied. One-half credit per quarter is allowed those who register in glee club.

TREBLE CLEF CLUB

This club for young women corresponds in scope and work to the men's glee club. Membership is limited to about twenty. This club is also under the direction of the music department. Both Glee and Treble Clef clubs appear at college functions and recitals during the year. One-half credit per quarter is allowed those who register in this club.

CHORAL CLUB

Student singers of both sexes are admitted without formal examination. The Choral club was recently organized to foster more general interest in part singing. The material used ranges from college songs to high-class part songs. With growth in membership larger choral works will be studied. The club has appeared on public programs with other musical organizations.

ORCHESTRA

Opportunity is given students who play any orchestral instrument to become members of the college orchestra, which contributes well selected numbers to public programs and plays an important part in assembly music and college "sings." One-half credit per quarter is allowed.

AGRICULTURAL SOCIETY

All agricultural students are eligible to membership in this society. Regular meetings are held for the discussion of topics of interest in scientific agriculture with special reference to the possibilities of farm life.

HOME ECONOMICS CLUB

This club is composed of women students who are working for a degree in home economics. Meetings are held for the discussion of topics of interest to students in home economics and also to keep in touch with the work of the alumni in this department.

THE CHEMICAL SOCIETY

The students taking the chemical course join this society for the purpose of developing an interest in the professional side of the subject and also for studying topics that do not come up in the regular class work. Regular meetings are held, and abstracts of recent journal articles are presented.

THE ALUMNAE CLUB

The active members of this organization are women graduates, residing in or near Bozeman; the associate members are the undergraduate women. The object of the club is to promote the interests of college women.

INTERFRATERNITY COUNCIL

An organization of women and men members of Greek letter fraternities. Its purpose is to stimulate effort in student activities, to advance the interests of the college, and to promote unity among the fraternal organizations for their individual and collective welfare, guidance and protection.

ASSOCIATED STUDENTS

An organization consisting of the whole body of students of the institution. The society is organized to manage all matters of general interest to students, as athletics, debates, oratory, and entertainments.

FRATERNITIES, SORORITIES, AND SOCIAL CLUBS

There are two fraternities which are as yet only local organizations, the Omega Beta, with a house on South Willson Avenue, and the Beta Epsilon, which maintains a house on South Grand

Avenue. The Sigma Chi, a national fraternity, has a chapter and maintains a house on South Third Avenue, and the Sigma Alpha Epsilon fraternity has a house on South Black Avenue. There is a senior honorary society known as the Septemviri. There is an honorary chemical fraternity known as the Alpha Pi, a national honorary agricultural fraternity known as the Alpha Zeta, and an honorary engineering fraternity, Sigma Epsilon. There is a national honorary forensic fraternity, the Pi Kappa Delta, and the Phi Kappa Phi, an honorary national scholarship fraternity. There is also a club for men, known as Les Bouffons, and an organization of men, known as Intercollegiate Knights. There is an organization known as The Looters, which has for its purpose the presentation of an annual student musical show. Students who are not members of Greek-letter social fraternities have an organization known as the Order of the Barbs. There are four national sororities, the Alpha Omicron Pi, with a house on South Sixth Avenue; the Chi Omega, with a house on West Olive; the Pi Beta Phi, with a house on South Grand Avenue; and the Phi Upsilon Omicron; two local sororities, the Iota Delta, with a house on West Main Street, and the Zeta Kappa, with a house on West Main. There is a senior honorary society known as the Cap and Gown, a women's literary club known as the Alpha Epsilon Theta, and a local writer's club, The Scribblers. There is also an organization for the women in the sophomore class known as the Spurs. Fraternities, sororities, and social clubs, like other student organizations, are under the supervision of the faculty.

SCHOLARSHIPS AND PRIZES

HIGH SCHOOL HONOR SCHOLARSHIPS

In order to promote the attendance of students of ability and promise upon the several institutions of the University of Montana it is the declared policy of the State Board of Education to provide for the awarding of scholarships to be known as the High School Honor Scholarships to graduates of the accredited high schools of the state.

The principal of each fully accredited high school in the state may nominate from each year's graduating class from one to four members, depending upon the size of the class (but not more than two for any one institution,) to be the recipients of high school honor scholarships. The scholarships exempt the holders from the payment of the customary fees in any of the institutions of the University of Montana. Blanks for nomination of scholars, with detailed statement of conditions, are furnished to the principals.

AGRICULTURAL CLUB SCHOLARSHIPS

Upon notice from the State Leader of Boys' and Girls' Agricultural Clubs of the awards of the annual club contests, the Chancellor will authorize the issuance of Agricultural Club Scholarships to the winners of first place in any agricultural club contest in any county in Montana, and to winners of first, second, and third places in the state agricultural club contests. These scholarships exempt the holders from the payment of the customary fees in any of the institutions of the University of Montana.

MILITARY SERVICE SCHOLARSHIPS

Upon the proper certification of the president that a student has rendered military or naval service to the nation and has been honorably discharged, the Chancellor of the University of Montana will authorize the award of a Military Service Scholarship to such student. The holder of such scholarship, throughout his course, will be exempt from the payment of all regular fees, but not laboratory deposits or special course tuitions.

By special action of the State Board of Education the privileges of the Military Service Scholarships are extended to all students of the University of Montana who met the requirements for membership in the Students' Army Training Corps and actually took up work in one of the corps of the University of Montana, but were deprived of induction through the action of the war department cancelling all inductions which were not complete November 11, 1918.

Y. W. C. A. SCHOLARSHIP

To provide assistance in meeting the living and college expenses, the College Y. W. C. A. is offering the sum of seventy-five dollars to be given to some young woman of character, ability and sense of responsibility, during the college year, 1922-23. This offer is for the one year unless the local Y. W. C. A. should decide to extend it. The young woman to whom the award is to be made is to be chosen by the officers of the College Y. W. C. A.

THE MONTANA FEDERATION OF WOMEN'S CLUBS SCHOLARSHIPS

Upon the nomination of the officers of the Montana Federation of Women's clubs, the State Board of Education has authorized the award of one scholarship each year in each of the institutions of the University. The holders of such scholarships are exempted from the payment of all customary fees except the student activity

fees and the special tuition fees in music. They are expected to make the required course deposits.

The Federation of Women's Clubs has arranged to assume the payment of certain of the expenses of the women to whom these scholarships are awarded for the first year of their college course, and to grant certain loans for the remaining three years to cover the expenses. The administration of these funds and loans is in the hands of a committee set up by the State Federation of Women's Clubs.

ARMSTRONG PRIZE IN DECLAMATION

Hon. F. K. Armstrong of Bozeman gives a prize of ten dollars to the winner of the annual declamatory contest of the secondary schools. There is also a second prize of five dollars. Only regular students are eligible.

STORY PRIZE IN EXTEMPORANEOUS SPEAKING

Hon. Nelson Story, Jr., gives an annual prize of twenty-five dollars toward an extemporaneous speaking contest. Fifteen dollars is given as first prize, and ten dollars as second prize. This contest is open to all regular students of the secondary schools.

STUDENT LOAN FUND

GENERAL UNIVERSITY STUDENT LOAN FUND

The Montana Bankers' Association, and the Alumni of the University of Nebraska residing in Montana, have each established funds which are available for students in the junior and senior classes of any of the institutions of the University of Montana who are unable to continue their studies without financial aid and are satisfactorily recommended as to character and scholarship by the dean or director or the head of the department in which the applicant's major work is done. The loan to any one student is limited to two hundred dollars during his course, and not more than one hundred dollars in any one year. Loans must be repaid within one year from the time of borrowing, or in exceptional cases, one year after graduation. Loans bear two per cent interest.

Application blanks and a statement of detailed regulations governing these loans may be obtained from the registrar.

STATE COLLEGE ALUMNI FUND

The Montana State College Alumni Loan Fund is for the purpose of assisting worthy students and alumni who are in need of

funds. Loans may be made to students of collegiate rank and alumni who have not been out of college more than two years.

A borrower is required usually to bring letters of recommendation from two to three members of the faculty and to sign a promissory note. The note bears four per cent interest during the life of the instrument and six per cent thereafter.

The Loan Fund Manager is usually a member of the staff of the Montana State College and has his office either on or near the campus.

INTERSCHOLASTIC CONFERENCE

BASKETBALL TOURNAMENT, SPEAKING CONTEST, AND ESSAY CONTEST

The annual Interscholastic Conference, high school basketball tournament, speaking contest and essay contest are held on Wednesday, Thursday, Friday and Saturday nearest the tenth of March. An invitation is extended to the sixteen high school basketball teams which have, during the basketball season, proved their superiority in competition with other teams. Appropriate school trophies are presented to the best teams, and suitable individual awards are given to the team members. In connection with the tournament an extemporaneous speaking contest and an essay contest are held.

LIBRARY AND READING ROOMS

MAIN LIBRARY

The library occupies the south half of the first floor of Montana Hall. It contains 19,305 volumes, not counting public documents, and about 6,000 pamphlets. It is well supplied with standard works in technology, history, science, and literature, as well as with dictionaries, cyclopedias and other reference works.

By an Act of Congress the library is a depository and receives all public documents and other printed matter issued by the United States government.

DEPARTMENT LIBRARIES

The agricultural library occupies two rooms on the first floor of the Agricultural Hall. It contains almost complete bound sets for all state experiment station bulletins and United States Department of Agriculture publications, besides a large number of agricultural papers and standard works. One room on the first floor of the biology building is used for the library and periodicals of the biological department. A library and reading room is maintained by the College of Engineering.

Experiment Station

Associated with the State College is the Montana Agricultural Experiment Station. This Station was established by an Act of Congress, (Hatch Act), passed in 1887, and supplemented by another act, (Adams Act), passed in 1906.

In the words of these Congressional Acts, the purpose of these appropriations is as follows:

"It shall be the object and duty of said Experiment Stations to conduct original researches and verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under the varying series of crops; the capacity of new plants of trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative effect on crops of different kinds; the adoption and value of grasses and forage crops; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories."

These acts define and limit the work of the Agricultural Experiment Station. It must be directed towards the solving of the practical agricultural problems of the state and making that industry more profitable to those engaged in it.

The appropriations from the federal government have been supplemented by state appropriations.

The work covered by the Experiment Station is indicated by the ten departments of work, which are as follows:

Agronomy, Animal Husbandry, Poultry, Horticulture, Farm Management, Agricultural Engineering, Chemistry, Entomology, Botany and Bacteriology, and Veterinary.

The College and Experiment Station farm consists of 320 acres of irrigated land adjoining the campus, and the Fort Ellis farm of about 600 acres of non-irrigated land, some four miles out. Well equipped laboratories are also provided for the various

departments, while all the farm buildings are arranged so as to facilitate the experiments with livestock. The equipment and facilities of the Experiment Station are available to a limited number of students for graduate work.

The great variation in the climate of the state makes necessary the establishment of substations to study the crop possibilities of various sections of the state. At present four such stations are in operation, viz: In the Judith Basin, near Moccasin; in the Yellowstone valley near Huntley; in northern Montana near Havre, and in the Bitter Root valley near Corvallis. The last substation is for the study of fruit and garden crops only. While not covering all the climatic regions of the state these substations afford opportunity for more complete study of the state's agricultural possibilities and particularly of the crops adapted to particular sections of the state.

The results of the studies and observations made by the station staffs are published in bulletins, circulars, leaflets, posters, etc. They are distributed free of cost to the people of the state who apply for them. Those who would like to receive the publication as issued may have their names placed on the permanent mailing list and receive the bulletins as soon as issued. Write to the Agricultural Experiment Station, Bozeman, Montana.

Agricultural Extension Service

The cooperative extension work in agriculture and home economics had its official beginning in the passage by Congress of the Smith-Lever Act of May 8, 1914.

It has been organized as the last of the three principal divisions of the State College. All federal and state extension service in Montana in agriculture and home economics has been placed in charge of an extension director.

The field work is grouped into two classes according to the area covered as the state and county service. The projects now under way are:

1. Agronomy.
2. Botany.
3. Boys' and Girls' club work.
4. County Agent work.
5. Extension Schools.
6. Dairy.
7. Farmers' Institute.
8. Farm Economics.
9. Horticulture.
10. Home Economics.
11. Irrigation.
12. Livestock.
13. Marketing.
14. Poultry.
15. Plants and Animal Protection.

Agronomy consists of instruction and demonstrations in field crops, crop rotation, seeds, and soil management.

Botany considers plant identification, information about poison plants, and treatment to prevent losses from plant diseases.

Boys' and girls' club work consists of clubs for corn-growing, potato-growing, gardening, pig, calf, colt and lamb-raising, canning, bread, and garment-making.

County agents are in several counties, carrying on local projects in crop-demonstration, community meetings and organization, livestock, dairy, better seed, rodent and insect control, and such incidental problems in farming and country life as may arise.

Extension schools in agriculture and home economics are held in farming communities by special arrangement, three to five in-

structors being provided by the extension service, classes continuing for three to six days.

The dairy work has to do with better cows and better breeding sires, cow-test association, silos and forage crops, feeding, shelter, and cooperative dairying.

Farmers' institutes have been held to the number of from one hundred to several hundred each year for about twenty years in Montana. The plan is to hold one and two-day meetings in the agricultural centers of each county each year, with lecturers distinguished as successful, practical farmers or as agricultural scientists, at each meeting.

Farm economics activities seek to increase good economic farm practices, and to eliminate the uneconomic, by keeping farm accounts and records. These are summarized, analyzed and studied. The farmer with this knowledge is able to expand his operations in the right direction. Scientific land settlement receives much attention.

Horticulture extension work is particularly directed towards the problems of home gardening, tree and small fruits, ornamental planting. Potato seed certification is one of its major projects.

Home economics demonstrations in a number of counties conducted by trained women seek to improve home conditions, health, and satisfaction in country living. Besides the agents who work with women in the various counties, state specialists, teaching nutrition and use and preparation of foods, clothing and millinery, and home management, are giving full time to these phases of home economics.

Irrigation extension activities are helping individuals and small communities to increase the areas under irrigation by utilizing small streams and by the storage and use of flood waters.

The livestock project aims at the improvement of livestock, a reduction of stock losses, and a better distribution of farm animals.

The marketing activities keep farmers better informed regarding markets for farm products, promote direct dealing between producer and consumer, and stimulate production by securing better markets and more profitable sales of farm products.

Plant and animal protection includes several types of work, among which are ground-squirrel eradication, the control of grasshoppers, cutworms and other insects. The destruction of predaceous animals, rabbit and mice extermination, blackleg and cholera vaccination, tuberculosis eradication, and the prevention of fungus and bacterial diseases through seed and other treatment.

Colleges of Instruction

A. The following four-years college courses, leading to the degree of Bachelor of Science, are offered:

1.—COLLEGE OF AGRICULTURE.

- (a) Agricultural Education.
- (b) Agricultural Engineering.
- (c) Agronomy.
- (d) Animal Husbandry.
- (e) Dairy.
- (f) Farm Management.
- (g) Horticulture.
- (h) General Agriculture.

2.—COLLEGE OF ENGINEERING.

- (a) Architectural Engineering.
- (b) Chemical Engineering and Industrial Chemistry.
- (c) Civil Engineering.
- (d) Electrical Engineering.
- (e) Engineering Physics.
- (f) Irrigation Engineering.
- (g) Mechanical Engineering.

3.—COLLEGE OF APPLIED SCIENCE.

- (a) Applied Science.
- (b) Bio-Chemistry.
- (c) Botany and Bacteriology.
- (d) Entomology and Zoology.

4.—COLLEGE OF HOUSEHOLD AND INDUSTRIAL ARTS.

- (a) Applied Art.
- (b) Home Economics.
- (c) Home Economics Vocational Training.
- (d) Secretarial Work.

B. The following courses, not leading to a Bachelor's Degree are offered:

- (a) School of Agriculture.
- (b) Secretarial Work.

College of Agriculture

Agriculture is one of the basic industries of Montana. The establishment of successful systems of agriculture depends on a thorough understanding of the requirements of Montana's soil and climate, the kinds of crops available, the methods of culture essential to profitable crop production, the type of livestock best suited to the varied conditions which obtain, the methods of feeding and handling this livestock, and finally, the principles of farm management and the economic disposal of farm products.

It is of the utmost importance that actual farm experiences constitute the foundation of every man's knowledge of agriculture, whatever the phase in which he might have a special interest. The attainment of a thorough knowledge of modern agriculture without instruction in the underlying sciences, is slow and expensive, if not quite impossible. Recognition of this fact led to the establishment of the State College of Agriculture, where students are now afforded opportunity to acquire a knowledge of the broad principles upon which agriculture is based.

The four-years curriculum in agriculture leads to the degree of Bachelor of Science in Agriculture. The special course in agriculture, open only to persons who already have a degree of A. B. or B. S. from a recognized college or university and who wish to teach vocational agriculture in high schools, also leads to the degree.

While the four-years course in agriculture is designed primarily to train students who expect to engage in farming, the training offered fits young men to take up work along a number of additional lines. The general course is a good preparation for county agent work and, by a careful choice of electives, it is possible to train for special work along the lines of agronomy, animal husbandry, dairying, horticulture, agricultural education, agricultural engineering, farm management and general agriculture.

AGRICULTURAL EDUCATION

The agricultural education course is designed to prepare persons for teaching vocational agriculture and for agricultural extension work. Courses in psychology, theory and practice, and special courses in agricultural education are the basis of the teaching practice which each student is required to do before he completes the course. Students are required to visit high schools in the

state where vocational agriculture is taught, and to work under the instructor for a period of not less than one week at a time. Students preparing for extension work are required to do a limited amount of work with county agents and extension specialists during the last quarter of their senior year.

AGRICULTURAL ENGINEERING

The work in agricultural engineering is to fit students to meet and successfully overcome the mechanical and engineering difficulties so commonly encountered on farms. In the courses, as taught, the instruction is along scientific methods of attacking practical problems. Special courses in irrigation, drainage and farm mechanics are offered students whose major work is in agricultural engineering.

AGRONOMY

The agronomy department gives instruction in field crops and soils, and its courses have been designed to familiarize the student with the underlying principles of crop production and soil management. While the conditions in the different parts of Montana are given special consideration, the instruction in the various courses is not limited by state lines. The results of crop and soil investigations being conducted at the different substations in Montana are made available for study. Experiments conducted by the agronomy department, together with the well equipped crops and soils laboratories and green house facilities, afford the student excellent opportunity for study and investigation. The principal aim in this work is to fit men more successfully to solve the crop and soil problems arising in the development of western agriculture under both dry land and irrigation conditions.

ANIMAL HUSBANDRY

Animal husbandry courses cover the various phases of livestock production, such as judging, selection, breeding, feeding, care and management for both farm and range conditions. The aim is to give the student a thorough training in practical and scientific livestock production. The work in judging begins with score-card practice, and leads to judging groups. Feeding is based upon scientific principles, and is made as practicable as possible. Study of pedigrees and breeding records gives a knowledge of the most desirable families or strains within different breeds, and points the way to livestock improvement.

Dairy manufacturing courses deal with the various phases of handling milk and cream on the farm and in the factory. They also give the theory and practice of butter and cheese-making, and

the manufacturing and marketing of frozen dairy products. Special attention is given to the management and operation of private and cooperative plants. Testing laboratories, modern creamery and cheese plants are available for student use.

FARM MANAGEMENT

Farm management courses give the student a basis of training by which he will be in better position to solve the problems of management that are so vital to the successful organization of the business of the modern farm. Farm management concerns itself with all those things that have to do with the profitable operation of the farm. The work given is of very practical nature. Facilities for instruction include some fourteen hundred business records of farms, representing all parts of the state and all types of farming.

HORTICULTURE

The courses in horticulture include a study of the requirement of the various vegetables and fruits as regards soils, climate and cultural practices adapted to each, and methods of propagation. The work is adapted to commercial production of fruits and vegetables as well as to growing them in home orchards and gardens. The work in landscape gardening includes the planting of wind-breaks, trees and shrubs on farmsteads, city lots, school grounds and parks to secure desirable effects without interfering with the practical purpose which they serve.

COURSE IN AGRICULTURE

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	4
Introductory Mathematics (Math. 109)			4
Livestock Judging (An. Husb. 101, 102)	3	3	
Poultry Management (Poult. 100)	4		
Agricultural Development (Agron. 100)	2		
General Botany (Bot. 100)		5	
Principles of Plant Production (Hort. 100)		3	
Farm Shop (Agri. E. 101)			3
Vegetable Gardening (Hort. 101)			3
Physical Education for Men (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1
*Farm Practice			
College Education (Ed. 100)	0		

* Every student on entering, must register for farm practice; and before a degree is conferred he must furnish evidence of having had at least six months of actual farm experience.

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Agricultural Chemistry (Chem. 208)		5	
General Zoology (Zool. 100)	4		
Field Crops (Agron. 200, 201)	3	4	
Forage Crops (Agron. 202)			5
Farm Dairy (Dairy 200)	3		
Community Dairying (Dairy 201)		3	
Economic Entomology (Ent. 202)			3
Agricultural Physics (Phys. 221)			5
Breeds of Livestock (An. Husb. 201, 202)		4	4
Principles of Feeding (An. Husb. 203)	2		
Farm Structures (Agri. E. 201)	3		
Physical Education for Men (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1

JUNIOR YEAR

Economics (Econ. 300)	3		
Fruit Growing (Hort. 305)		3	
Veterinary Physiology and Anatomy (Vet. Sci. 301)	4		
Bacteriology (Bact. 201)		4	
Common Diseases (Vet. Sci. 305)			5
Principles of Soil Management (Agron. 311, 312)	3	3	
Co-operation and Extension Methods (Agri. Ed. 309)		3	
Organic Evolution (Zool. 302)			4
Farm Management (F. M. 301)			3
Electives	8	5	6

SENIOR YEAR

Agricultural Economics (Econ. 320)		3	
Field Crop Improvement (Agron. 305)	3		
Dry Land Farming (Agron. 304)	3		
Farm Machinery (Agri. E. 302) or			
Farm Motors (Agri. E. 303)		3	
Use of Irrigation Water (Agri. E. 306)	3		
Sanitary Science (Vet. Sci. 304)			3
Breeding Farm Animals (An. Husb. 304)			3
Beef Cattle and Sheep Production (An. Husb. 305)		4	
Swine and Horse Production (An. Husb. 306)			2
Dairy Production (An. Husb. 307)			3
General Agricultural Seminar (A. H. 313)	1	1	
Electives	8	7	6

Those who expect to engage in practical agricultural work or to enter some other field to which a more general course is best adapted, may choose electives from several departments.

Students may specialize in their junior and senior years in agricultural education, agricultural engineering, agronomy, animal husbandry, farm management or horticulture; it is also possible for those particularly interested in the sciences to select electives from the departments of chemistry, entomology and zoology, or botany and bacteriology.

Substitutions may be made in the tabulated course in order to permit greater specialization than is offered with present tabulated course. This can be done only with the consent of the Dean of Agriculture and of the department concerned.

Students whose major work is in any one department will classify for the junior and senior years with the head of the department in which the work is selected; those selecting a general line of electives from the several departments in agricultural work and those selecting electives in the sciences will classify with the Dean of Agriculture.

JUNIOR YEAR ELECTIVES

Agronomy

	Autumn	Winter	Spring
Management Special Soil Types (Agron. 313)			3
Grain Inspection and Judging (Agron. 300)	3		
Principles of Agronomic Experimentation (Agron. 306)			1

Animal Husbandry

Advanced Stock Judging (A. H. 301)	2		
Nutrition of Farm Animals (A. H. 302)		4	
Handling and Fitting Livestock (A. H. 303)			2

Agricultural Education and Education

Administration of Vocational Education (Agr. Ed. 307)		3	
Psychology (Ed. 300)	3		
Development of Vocational Education (Ed. 303)			3
Principles and Methods of Teaching (Ed. 304)			3
Forging (M. E. 101)		2	

Agricultural Engineering

Farm Shop, Advanced (Agri. E. 301)		3	
Irrigation Water Supply (Agri. E. 305)		3	
Drainage (Agri. E. 308)			3

Dairy

Inspection of Milk Products (Dairy 300)	3		
Market Milk (Dairy 301)			4
Creamery Butter Making (Dairy 304)		3	

Horticulture

Systematic Pomology (Hort. 300)	5		
Commercial Vegetable Growing (Hort. 304)		5	
Trees, Shrubs, and Flowers on Farm (Hort. 306)	2		
Horticultural Practices (Hort. 308)	3		

Poultry Husbandry

Poultry Breeds (Poult. 200)	3		
Incubation (Poult. 303)		3	
Brooding (Poult. 304)			3

	Autumn	Winter	Spring
Chemistry			
Agricultural Organic Chemistry (Chem. 207)	6		
Physiological Chemistry (Chem. 310)		5	
Qualitative Analysis (Chem. 203)	5		
Quantitative Analysis (Chem. 204, 205)		5	5
Entomology and Zoology			
Advanced Economic Entomology (Ento. 304)			4
Vertebrate Zoology (Zool. 300)			5
Botany and Bacteriology			
Plant Physiology (Bot. 300)			6
Plant Pathology (Bot. 301)		6	
Farm Management			
Farm Organization (F. M. 302)			3
Economics			
Marketing Farm Products (Econ. 322)	3		
Irrigation Institutions and Economics (Econ. 330)			3

SENIOR YEAR ELECTIVES

Agronomy

	Autumn	Winter	Spring
Field Experiments (Agron. 307, 308, 309)	2	2	2
Advanced Crops (Agron. 310)		2	
Thesis (Agron. 301, 302, 303)	2	2	2

Animal Husbandry

Experimental Feeding (A. H. 308)		3	
Thesis (A. H. 309)		3	3
Advanced Judging and Pedigree Study of Dairy Cattle (A. H. 310).....			2

Agricultural Education

Practice Teaching (Agr. Ed. 304, 305, 306)	4	4	4
Vocational Agricultural Educational (Agr. Ed. 300)		3	
Cooperation and Extension Methods in Field (Agr. Ed. 309)			3
Thesis and Seminar (Agr. Ed. 313)			3

Agricultural Engineering

Farm Machinery (Agri. E. 302)		3	
Farm Motors (Agri. E. 303)		3	
Tractor Operation (Agri. E. 304)			3
Irrigation Farming (Agri. E. 307)			4
Thesis (Agri. E. 310)	2	2	2
Seminar (Agri. E. 309)			1

Dairy

Cheese Making (Dairy 303)	4		
Factory Management (Dairy 304)		3	
Dairy Technology (Dairy 305)			3

Farm Management

Types of Farming (F. M. 304)			3
Farm Accounting (F. M. 303)			3

Horticulture

Greenhouse Construction and Management (Hort. 301)		4	
Landscape Gardening (Hort. 302)	4		
Thesis (Hort. 303)	2	2	2
Small Fruit Culture (Hort. 307)			2
Commercial Fruit Growing (Hort. 309).....			4
Commercial Handling of Fruit (Hort. 310)	3		
Orchard Work (Hort. 311)	1		
Seminar (Hort. 312)			1

Poultry Husbandry

Poultry Houses (Poult. 300)	3		
Marketing Poultry Products (Poult. 301)	3		
Advanced Poultry Breeding (Poult. 400)		3	
Poultry Feeds and Feeding (Poult. 305)	3	3	
Thesis (Poult. 401)	2	2	2

Veterinary Science

	Autumn	Winter	Spring
Pathology (Vet. Sci. 302)		3	
Obstetrics (Vet. Sci. 303)			3
Parasites of Domestic Animals (Vet. Sci. 306)			3

Chemistry

Physiological Chemistry (Chem. 310)		5	
Agricultural Organic Chemistry (Chem. 207).....	6		
Quantitative Analysis (Chem. 204, 205)		4	4
Geology (Geol. 300)		4	

Entomology and Zoology

Advanced Economic Entomology (Ento. 304)			4
Embryology (Zool. 301)		5	
General and Systematic Entomology (Ento. 203)	4		
Vertebrate Zoology (Zool. 300)			5

Economics

Sociology (Soc. 310)			3
Rural Sociology (Soc. 321)			3
Irrigation Institutions and Economics (Econ. 330).....			3

Students may choose subjects offered by other departments which are not listed under this grouping.

College of Engineering

This college offers four-years courses in Architectural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, Engineering Physics, and Industrial Chemistry.

The courses of study follow the accepted practice in the leading engineering colleges of the United States, the aim being to instruct the students thoroughly in the fundamental sciences upon which all engineering rests, and to impart such special and technical knowledge of the various branches of engineering as will fit the graduates to embark upon successful careers in their chosen fields. Classroom instruction in the fundamental applied sciences is supplemented by practical experience in the field, shops, laboratories and drafting rooms.

In addition to the present facilities, a new engineering building and modern shops and laboratories are under construction and should be ready for occupancy in the autumn of 1922. These new buildings with the additional apparatus to be installed, will place the engineering equipment at the Montana State College among the very best in the northwestern states.

ARCHITECTURAL ENGINEERING

The course is intended to provide training which the student will need to prepare himself for the practice of architecture as a profession.

In addition to the science which is common to all engineering courses, this course includes a thorough training in freehand drawing, the basis of all architectural design. Ancient and modern architecture are studied historically, so that the student may become acquainted with the best examples and draw inspiration from them for design. The construction of steel and concrete buildings, the sanitation of buildings, interior and exterior decoration, heating and ventilation, and illumination form important parts of the instruction given. More attention is given to design than is usual in architectural engineering courses.

CHEMICAL ENGINEERING AND INDUSTRIAL CHEMISTRY.

The courses of instruction that constitute the four-years course in chemical engineering and industrial chemistry are chosen to train men to take a leading part in the development and operation of those

industries and manufacturing pursuits which are based on the applications of chemistry.

The work of the course in chemical engineering can be classified in three groups: first, courses which provide thorough knowledge of the principles of general, analytical, physical, organic and industrial chemistry: second, those courses which provide a knowledge of mathematics, physics, and engineering, including both mechanical and electrical engineering subjects: third, courses which give the student training in chemical engineering proper. In these courses the principles of chemistry and of engineering are applied to industrial operations.

In the course in industrial chemistry, engineering subjects are not required, and in place of these subjects the student may take elective courses subject to the approval of the class adviser.

Inspection trips are made to the various industrial plants in the state. The studies carried on at these plants are carefully systematized in order to give the student an opportunity to observe the application of the principles of chemistry and chemical engineering.

CIVIL ENGINEERING

The civil engineering course is arranged to give a broad training in the general and scientific subjects which are the foundation of all branches of technology, and special training in those subjects comprised under the term "Civil Engineering." The young men are taught how to think, and how to attack new problems. They are taught the underlying principles of engineering, and are inspired with a desire to do their best work. The students study many problems connected with the location and construction of railroads, public highways, bridges, water works, water power development, irrigation, sewage systems, and sewage disposal, city and municipal engineering.

ELECTRICAL ENGINEERING.

The course in electrical engineering gives a thorough technical training, combining theoretical instruction and the applications of theory to the solution of practical problems.

The general training consists of courses in English, mathematics, physics, chemistry, drawing and shop work. The technical work covers the theory and application of electrical phenomena, and the designing and testing of electrical machines and apparatus.

The equipment of the electrical laboratory includes apparatus of modern type, as well as machines of historical value. The laboratories contain various types of direct and alternating current dynamos and motors, storage batteries, an oscillograph, a 150,000 volts transformer, a wireless station, and other equipment. A new electrical laboratory with additional equipment will be ready during the year. 1922.

ENGINEERING PHYSICS.

For research work in the laboratories of the large engineering corporations and of the U. S. Government, a training is desirable containing the essentials of an engineering course, together with a thorough grounding in those physical sciences which have contributed so greatly to the advancement of the past few years.

Opportunities for engineering physicists are found in the U. S. Bureau of Standards, in the laboratories of the electric companies, in radio telegraphy and telephony, optics and photography, aeronautics, in hospitals as X-ray and radium experts, and in many other fields and industries.

IRRIGATION ENGINEERING.

The future growth of many large sections of agricultural Montana and the Northwest will require the development of the irrigation possibilities of those sections. That this is recognized by the progressive communities is indicated by the number of large irrigation projects started in the last few years. The present existing irrigation systems must, in many cases, be improved to obtain the maximum returns from the water carried by these systems.

Irrigation is an important and growing part of the engineering profession in Montana.

Students who desire to specialize in irrigation follow the regular course in civil engineering, but substitute the special irrigation subjects Civil Engineering 360 to 364 for some of the required work in railroad, sanitary and municipal engineering.

MECHANICAL ENGINEERING.

The course in mechanical engineering aims to furnish fundamental training in the design, construction, testing and operation of power and manufacturing machinery, and in the management of manufacturing operations and enterprises. Closely correlated instruction and training by textbook, lecture, laboratory and shop practice acquaint the student both theoretically and practically with the forces which he must control, with the qualities and values of the materials of engineering, and with the practical and economic considerations which govern design and construction. One of the prime considerations is to develop original thinking and conceptions based on scientific and practical lines.

In addition to the technical instruction, the student is familiarized with the present-day industrial problems and with the modern business methods in industrial organization. The course is planned to give a general training for the broad field of the mechanical engineer by a thorough grounding in the fundamentals rather than intense specialization, but some opportunity for specialization in a chosen line or for broader cultural studies is offered by electives in the senior year.

COURSE IN ARCHITECTURAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	4
Engineering Mathematics (Math. 101, 102, 103)	5	5	5
Engineering Drawing (E. D. 101, 102, 103)	3	3	3
Architectural Drawing (A. E. 101, 102, 103)	2	2	2
Physical Education for Men (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1
Seminar (A. E. 181, 182, 183)	0	0	0
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Engineering Mathematics (Math. 201, 202, 203)	4	4	4
Engineering Physics (Phys. 201, 202, 203)	3	3	3
Physical Measurements (Phys. 207, 208, 209)	2	2	2
History of Architecture (A. E. 221, 222, 223)	2	2	2
Architectural Drawing (A. E. 201)	3		
Working Drawings (A. E. 211)	3		
Working Drawings (A. E. 212)		3	
Statics (C. E. 220)		3	
Dynamics (C. E. 221)			3
Design (A. E. 233)			3
Physical Education for Men (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1
Seminar (A. E. 281, 282, 283)	0	0	0

JUNIOR YEAR

French (French 100, 101, 102)	4	4	4
History of Architecture (A. E. 321, 322, 323)	2	2	2
Graphics (A. E. 341, 342, 343)	3	3	2
Design (A. E. 331, 332, 333)	4	4	3
Mechanics of Materials (C. E. 320)	5		
Strength of Materials (C. E. 321)		1	
Working Drawings (A. E. 312)		4	
Hydraulics (C. E. 334)			2
Engineering Economics (C. E. 382)			3
Building Sanitation (A. E. 313)			2
Seminar (A. E. 381, 382, 383)	1	1	1

SENIOR YEAR

Advanced English Composition (Eng. 301, 302, 303)	2	2	2
Economics (Econ. 300, 301)	3	3	
Electrical Equipment of Buildings (E. E. 451)	4		
Concrete Design (C. E. 343)	4		
Steel Mill Buildings (A. E. 451)	3		
Surveying (C. E. 104)	2		
Architectural Engineering (A. E. 462, 463)		3	2
Thesis (A. E. 472, 473)		3	4
Cement Laboratory (C. E. 346)		2	
Architectural Engineering (A. E. 452)		2	
Heat Engines (M. E. 335)		3	
Heating and Ventilation (M. E. 436)			2
Contracts (C. E. 380)			2
Architectural Engineering (A. E. 466)			3
Building Specifications (A. E. 413)			3
Seminar (A. E. 481, 482, 483)	1	1	1

COURSES IN CHEMICAL ENGINEERING AND INDUSTRIAL CHEMISTRY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	6
Engineering Mathematics (Math. 101, 102, 103)	5	5	5
Seminar (Chem. 105, 106, 107)	0	0	0
Physical Education (Phys. Ed. 101, 102, 103)	1	1	1
Military Science (Mil. Sci. 101, 102, 103)	1	1	1
College Education (Ed. 100)	0		

Chemical Engineering

Engineering Drawing (E. D. 101, 102, 103)	3	3	3
Shop Work (M. E. 101, 102)	2	2	

Industrial Chemistry

Electives	5	5	3
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SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Qualitative Analysis (Chem. 203)	5		
Quantitative Analysis (Chem. 204, 205)			5
Engineering Mathematics (Math. 201, 202, 203)	4	4	4
Engineering Physics (Phys. 201, 202, 203)	3	3	3
Physical Measurements (Phys. 207, 208, 209)	2	2	2
Seminar (Chem. 105, 106, 107)	1	1	1
Physical Education (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1

JUNIOR YEAR

Economics (Econ. 300, 301)	3	3	
Physical Chemistry (Chem. 330, 331)		5	5
Organic Chemistry (Chem. 311, 312, 313)	5	5	5
Quantitative Analysis (Chem. 301)	4		
Engineering Chemistry (Chem. 321, 323)	2		4
Seminar (Chem. 341, 342, 343)	1	1	1

Chemical Engineering

Kinematic Drawing (M. E. 221, 222)	1	1	
Mechanism (M. E. 224)	3		
Statics (C. E. 220)		3	
Dynamics (C. E. 221)			3

Industrial Chemistry

Electives	4	4	3
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SENIOR YEAR

Advanced English Composition (Eng. 301, 302, 303)	2	2	2
Industrial Chemistry (Chem. 401, 402, 403)	5	4	5
Electro Chemistry (Chem. 427)	5		
Water Analysis (Chem. 415)			4
Fuel and Oil Analysis (Chem. 414)		3	
Seminar (Chem. 341, 342, 343)	1	1	1

Chemical Engineering

Electrical Power (E. E. 352, 353)		3	4
Heat Engines (M. E. 335)		3	
Mechanics of Materials (C. E. 320)	5		
Hydraulic Engineering (C. E. 332)			3
Mechanical Laboratory (M. E. 345)		2	

Industrial Chemistry

Electives	5	8	7
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COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	4
Engineering Mathematics (Math. 101, 102, 103)	5	5	5
Engineering Drawing (E. D. 101, 102, 103)	3	3	3
Land Surveying (C. E. 101, 102, 103)	2	2	2
Seminar (C. E. 391, 392, 393)	0	0	0
Physical Education for Men (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Engineering Mathematics (Math. 201, 202, 203)	4	4	4
Engineering Physics (Phys. 201, 202, 203)	3	3	3
Physical Measurements (Phys. 207, 208, 209)	2	2	2
Surveying (C. E. 201)	6		
Highway Engineering (C. E. 210)		3	
Statics (C. E. 220)		3	
Dynamics (C. E. 221)			3
Geology (Geol. 300)			4
Seminar (C. E. 391, 392, 393)	0	0	0
Physical Education for Men (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1

JUNIOR YEAR

Economics (Econ. 300, 301)	3	3	
Mechanics of Materials (C. E. 320)	5		
Graphic Statics (A. E. 341)	3		
Highway Engineering (C. E. 310, 311)	4	4	
Precise Surveying (C. E. 301)	3		
Seminar (C. E. 391, 392, 393)	1	1	1
Hydraulics (C. E. 330)		4	
Strength of Materials (C. E. 321)		1	
Roofs and Bridges (C. E. 341)		4	
Cement Laboratory (C. E. 346)		2	
Bridge Design (C. E. 342)			5
Hydraulic Engineering (C. E. 333)			6
Engineering Economics (C. E. 382)			3
Hydraulic Laboratory (C. E. 331)			1
Railroad Engineering (C. E. 350)			3

SENIOR YEAR

Irrigation Engineering (C. E. 360, 361)	3	3	
Concrete Design (C. E. 343, 344)	4	4	
Municipal Engineering (C. E. 370)	4		
Railroad Engineering (C. E. 351)	3		
Seminar (C. E. 391, 392, 393)	1	1	1
Electric Power (E. E. 352)		3	
Heat Engines (M. E. 335)		3	
Sanitary Engineering (C. E. 371)			5
Foundations (C. E. 345)			3
Engineering Contracts (C. E. 380)			2
Thesis (C. E. 381)			3
Electives	3	4	4

COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
Engineering Mathematics (Math. 101, 102, 103)	5	5	5
General Chemistry (Chem. 101, 102, 103)	4	4	4
Engineering Drawing (E. D. 101, 102, 103)	3	3	3
Shop Work (M. E. 101, 102, 103)	2	2	2
Physical Education for Men (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1
Seminar (E. E. 101, 102, 103)	0	0	0
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Engineering Mathematics (Math. 201, 202, 203)	4	4	4
Statics (C. E. 220)		3	
Dynamics (C. E. 221)			3
Engineering Physics (Phys. 201, 202, 203)	3	3	3
Physical Measurements (Phys. 207, 208, 209)	2	2	2
Electrical Machinery (E. E. 211)	3		
Electrical Diagrams (E. E. 231, 232, 233)	1	1	1
Machine Work (M. E. 201)	2		
Surveying (C. E. 202, 203)		2	2
Physical Education for Men (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1
Seminar (E. E. 201, 202, 203)	0	0	0

JUNIOR YEAR

Economics (Econ. 300, 301)	3	3	
Engineering Economics (C. E. 382)			3
Mechanics of Materials (C. E. 320)	5		
Electricity and Magnetism (Phys. 301, 302)	3	3	
Direct Currents (E. E. 311, 312, 313)	3	3	4
Dynamo Design (E. E. 331, 332, 333)	1	2	3
Electrical Laboratory (E. E. 321, 322, 323)	1	1	2
Heat Engines (M. E. 335)		3	
Hydraulics (C. E. 332)			3
Mechanical Laboratory (M. E. 345)		2	
Seminar (E. E. 301, 302, 303)	1	1	1
Strength of Materials (C. E. 321)	1		
Mechanical Practice (M. E. 202)			2

SENIOR YEAR

Alternating Currents (E. E. 411, 412, 413)	4	4	4
Electrical Design (E. E. 431, 432, 433)	3	3	3
Electrical Laboratory (E. E. 421, 422, 423)	3	3	2
Seminar (E. E. 401, 402, 403)	1	1	1
Thesis (E. E. 491, 492, 493)	1	4	3
Contracts and Specifications (C. E. 380)			2
Engineering of Power Plants (M. E. 434)	3		
Elective	3	3	3

COURSE IN ENGINEERING PHYSICS

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
Engineering Mathematics (Math. 101, 102, 103)	5	5	5
General Chemistry (Chem. 101, 102, 103)	4	4	6
Surveying (C. E. 104)	2		
Forging (M. E. 101)		2	
Engineering Drawing (E. D. 101, 102, 103)	3	3	3
Seminar	0	0	0
Physical Education for Men (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Engineering Mathematics (Math. 201, 202, 203)	4	4	4
Engineering Physics (Phys. 201, 202, 203)	3	3	3
Physical Measurements (Phys. 207, 208, 209)	2	2	2
Qualitative Analysis (Chem. 203)	5		
Statics (C. E. 220)		3	
Dynamics (C. E. 221)			3
Electrical Diagrams (E. E. 231)	1		
Hydraulics (C. E. 332)			3
Machine Work (M. E. 201)		2	
Physical Education for Men (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1
Seminar	0	0	0

JUNIOR YEAR

Electricity and Magnetism (Phys. 301, 302)	3	3	
Light and Sound (Phys. 303)			3
Physical Measurements (Phys. 309)			2
Mechanics of Materials (C. E. 320)	5		
Differential Equations (Math. 301, 302, 303)	3	3	3
Modern Language	4	4	4
Advanced English Composition (Eng. 301, 302, 303)	2	2	2
Least Squares and Probable Error (Math. 313)			3
Mechanical Laboratory (M. E. 345)		2	
Heat Engines (M. E. 335)		3	
Seminar	1	1	1

SENIOR YEAR

Economics (Econ. 300, 301)	3	3	
Kinetic Theory of Gases (Phys. 304)		3	
Electron Theory (Phys. 327)			3
Diffraction Phenomena (Phys. 333)	2		
Advanced Heat (Phys. 305)	4		
Modern Language	4	4	4
Electrical Power (E. E. 352, 353)		3	4
Elective and Thesis	4	4	6
Seminar	1	1	1

COURSE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
Engineering Mathematics (Math. 101, 102, 103)	5	5	5
General Chemistry (Chem. 101, 102, 103)	4	4	4
Engineering Drawing (E. D. 101, 102, 103)	3	3	3
Surveying (C. E. 104)	2		
Forging (M. E. 101)		2	
Foundry (M. E. 102)			2
Physical Education for Men (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1
Seminar (M. E. 111, 112, 113)	0	0	0
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Engineering Mathematics (Math. 201, 202, 203)	4	4	4
Engineering Physics (Phys. 201, 202, 203)	3	3	3
Physical Measurements (Phys. 207, 208, 209)	2	2	2
Mechanism (M. E. 224)	3		
Statics (C. E. 220)		3	
Dynamics (C. E. 221)			3
Kinematic Drawing (M. E. 221, 222, 223)	1	1	1
Pattern Work (M. E. 103)	2		
Mechanical Practice (M. E. 202)		2	
Machine Work (M. E. 201)			2
Physical Education for Men (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1
Seminar (M. E. 211, 212, 213)	0	0	0

JUNIOR YEAR

Economics (Econ. 300, 301)	3	3	
Engineering Economics (C. E. 382)			3
Mechanics of Materials (C. E. 320)	5		
Strength of Materials (C. E. 321)		1	
Valve Gears (M. E. 321)	2		
Electrical Power (E. E. 352, 353)		3	4
Machine Elements (M. E. 322, 323)		3	3
Steam Engines and Boilers (M. E. 331)	4		
Thermodynamics (M. E. 332, 333)		4	4
Mechanical Laboratory (M. E. 341, 342, 343)	2	2	2
Machine Tool Work (M. E. 301, 302)	2	2	
Heat Treatment of Steels (M. E. 303)			2
Seminar (M. E. 311, 312, 313)	1	1	1

SENIOR YEAR

Gas Power Engineering (M. E. 431)	4		
Mechanical Engineering of Power Plants (M. E. 435)		4	
Heating and Ventilation (M. E. 436)			2
Contracts and Specifications (C. E. 380)			2
Machine Design (M. E. 421, 422, 423)	3	3	3
Manufacturing Methods and Machinery (M. E. 414)	3		
Mechanical Laboratory (M. E. 441)	2		
Hydraulics (C. E. 330)		4	
Hydraulic Laboratory (C. E. 331)			1
Industrial Organization and Management (M. E. 416)			3
Seminar (M. E. 411, 412, 413)	1	1	1
Thesis (M. E. 444, 445, 446)	2	2	2
Elective	3	4	4

College of Applied Science

The departments comprised in the College of Applied Science have a two-fold duty to perform.

(1) They give instruction and training in the fundamental sciences as applied in agriculture, engineering, and home economics. A large and important part of the students' work in these major divisions of the institution is given in the science departments.

(2) They also offer several courses of instruction in which the main object is to prepare specialists in the various branches of the basic sciences. These courses also give an excellent general training, and may be taken by those students of agriculture, engineering, and home economics who desire to give more attention to the fundamental and less to the more specialized branches of agriculture, engineering and home economics.

The courses of instruction in the College of Applied Science, each leading to the degree of Bachelor of Science, are as follows: 1, Applied Science; 2, Botany and Bacteriology; 3, Bio-Chemistry; 4, Entomology and Zoology.

BOTANY AND BACTERIOLOGY

The four-years course leading to a degree in botany and bacteriology has two major purposes aside from its disciplinary value. First, to train men for professional careers in botany, plant pathology, agricultural bacteriology and related subjects; second, to prepare students for the study of medicine in other institutions. With a judicious selection of electives this is a very good pre-medical course.

In addition to the regular laboratory courses required, a number of the best students have an opportunity of working in the laboratories of the experiment station, where they can become familiar with the methods used in research work.

CHEMISTRY

The application of chemistry to the various phases of agriculture, to home economics, to engineering and to many modern industries make this science an important one in a technical school.

The college of engineering offers a four-years course in chemical engineering and a four-years course in industrial chemistry.

For details regarding these courses reference should be made to the schedules of courses under the college of engineering.

The division of applied science offers a four-years course in bio-chemistry. This course gives the students an excellent foundation in fundamental courses of both chemistry and biology. The course prepares students for positions in state and municipal food laboratories, water purification plants, experiment station laboratories and for other positions where a knowledge of both chemistry and biology is important.

ENTOMOLOGY AND ZOOLOGY

The courses in this department are primarily designed to give training in the zoological branches as they are applied in general agriculture and home economics. They form a basis for an understanding of the various phases of the development of life and the problems of evolution. They throw light on the problems of social science and are well designed for purposes of general education.

The department is equipped with the necessary microscopes, microtomes, photographic apparatus and dark rooms, and miscellaneous equipment. The various animal groups are well represented in the collections. In the museum room are about five hundred skins of mammals and birds, while among the study materials is an unusually full series of marine and fresh water invertebrates.

The insect collections are especially large and useful. Many thousands of pinned specimens are arranged in the cabinets and these, together with the microscopical slides and alcoholic materials, constitute one of the best insect collections in the west.

COURSE IN APPLIED SCIENCE**FRESHMAN YEAR**

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103).....	4	4	4
French (French 101, 102, 103) or Spanish (Span. 120, 121, 122)	4	4	4
Elementary Analysis (Math. 104, 105, 106)or Engineering Mathematics (Math. 101, 102, 103).....	4-5	4-5	4-5
Physical Education (Phys. Ed. 101, 102, 103).....	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103).....	1	1	1
Home Living (H. E. 109, 110).....	1	1	
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203).....	2	2	2
European History (Hist. 101, 102, 103).....	3	3	3
Physical Education (Phys. Ed. 201, 202, 203).....	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203).....	1	1	1

Option I

Science option from groups tabulated below select.....	5-6	5-6	5-6
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AUTUMN

Zoology 100
Chemistry 311
Chemistry 207

WINTER

Zoology 201
Botany 100
Chemistry 312
Geology 300
Physics 214

SPRING

Entomology 202
Botany 101
Chemistry 313
Chemistry 209
Physics 215

Electives	6	6	6..
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Option II

Engineering Physics (Phys. 201, 202, 203).....	3	3	3
Engineering Physics (Phys 207, 208, 209).....	2	2	2
Engineering Mathematics (Math. 201, 202, 203).....	5	5	5

JUNIOR YEAR

Nineteenth Century Literature (Eng. 303, 309, 310).....	3	3	3
Psychology (Ed. 300)	3		
Educational Psychology (Ed. 301)		3	
Development of Vocational Education (Ed. 303).....			3
American History (Hist. 451, 452, 453).....	3	3	3
Science or Mathematics	5	5	5
Elective	4	4	4

SENIOR YEAR

Contemporary Literature (Eng. 311, 312, 313)	3	3	3
Economics (Econ. 300, 301).....	3	3	
Sociology (Soc. 310)			3
Science or Mathematics	7	7	7

COURSE IN BIO-CHEMISTRY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103).....	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	6
Elementary Analysis (Math. 104, 105 106).....	4	4	4
General Zoology (Zool. 100)	4		
Seminar (Chem. 105, 106, 107)	0	0	0
Physical Education (Phys. Ed. 101, 102, 103).....	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103).....	1	1	1
Electives	3-4	4-5	4-5

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203).....	2	2	2
Qualitative Analysis (Chem. 203)	5		
Quantitative Analysis (Chem. 204, 205).....		5	5
General Physics (Phys. 214, 215)		5	5
General Bacteriology (Bact. 201)	5		
Sanitary Bacteriology (Bact. 202)		3	
Microbiology of Waters (Bact. 203)			5
Seminar (Chem. 105, 106, 107)	1	1	1
Physical Education (Phys. Ed. 201, 202, 203).....	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203).....	1	1	1
Elective	4-5		

JUNIOR YEAR

Economics (Econ. 300, 301)	3	3	
Quantitative Analysis (Chem. 301, 303)	4		4
Physical Chemistry (Chem. 330, 331)		5	5
Organic Chemistry (Chem. 311, 312, 313).....	5	5	5
Seminar (Chem. 341, 342, 343)	1	1	1
Electives	4-5	4-5	4-5

SENIOR YEAR

Advanced English Composition (Eng. 301, 302, 303)	2	2	2
Water Analysis (Chem. 415)			4
Electrochemistry (Chem. 427)	5		
Seminar (Chem. 341, 342, 343)	1	1	1
Fuel and Oil Analysis (Chem. 414)		3	
Electives	8-10	10-12	9-11

COURSE IN BOTANY AND BACTERIOLOGY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
Drawing from Nature (Art 103)	2		
General Chemistry (Chem. 101, 102, 103)	4	4	6
Elementary Analysis (Math. 104, 105, 106)	4	4	4
General Zoology (Zool. 100)	4		
General Botany (Bot. 100)		5	
Systematic Botany (Bot. 101)			5
Physical Education (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Morphology and Histology (Bot. 200)	5		
Human Physiology (Zool. 201)		6	
General Bacteriology (Bact. 201)	5		
Sanitary Bacteriology (Bact. 202)		3	
Microbiology of Waters (Bact. 203)			5
General Physics (Phys. 214, 215)		5	5
Economic Entomology (Ent. 202)			3
Seminar (Bot. 402, 403, 404)	1	1	1
Drawing from Nature (Art 201)	3		
Physical Education (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1

JUNIOR YEAR

Advanced English Composition (Eng. 301, 302, 303)	2	2	2
Organic Chemistry (Chem. 311, 312, 313) or	5	5	5
Agricultural Organic Chemistry (Chem. 207)	6		
and			
Agricultural Chemistry (Chem. 208)		6	
and			
Food Chemistry (Chem. 209)			6
Geology (Geol. 300)		4	
Psychology (Ed. 300)	3		
Educational Psychology (Ed. 301)		3	
Plant Pathology (Bot. 301)	6		
Seminar (Bot. 402, 403, 404)	1	1	1
Plant Physiology (Bot. 300)			6
Elective		2-4	2-4

SENIOR YEAR

Economics (Econ. 300, 301)	3	3	
Sociology (Soc. 310)			3
Embryology (Zool. 301)		5	
Organic Evolution (Zool. 302)			4
Bacteriological Methods (Bact. 401)			5
Mycology (Bot. 400)		5	
Seminar (Bot. 402, 403, 404)	1	1	1
Thesis (Bot 405)	5	5	5
Elective	7-9	0	0

COURSE IN ENTOMOLOGY AND ZOOLOGY

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
Drawing from Nature (Art 103)	2		
General Chemistry (Chem. 101, 102, 103)	4	4	6
Elementary Analysis (Math. 104, 105, 106)	4	4	4
General Zoology (Zool. 100)	4		
General Botany (Bot. 100)		5	
Systematic Botany (Bot. 101)			5
Physical Education (Phys. Ed. 101, 102, 103).....	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103).....	1	1	1
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Agricultural Organic Chemistry (Chem. 207)	6		
General Bacteriology (Bact. 201)	5		
Human Physiology (Zool. 201)		6	
Economic Entomology (Ento. 202)			3
General Physics (Phys. 214, 215)		5	5
Invertebrate Zoology (Zool. 200)			4
Principles of Plant Production (Hort. 100)		3	
Field Crops (Agron. 200)	3		
Physical Education (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203).....	1	1	-

JUNIOR YEAR

Advanced English Composition (Eng. 301, 302, 303).....	2	2	2
General and Systematic Entomology (Ento. 203)	4		
Systematic Entomology (Ento. 305)	4	4	
Advanced Economic Entomology (Ento. 304)			4
Organic Evolution (Zool. 302)			4
Embryology (Zool. 301)		5	
Electives	7	7	8

SENIOR YEAR

Economics (Econ. 300, 301)	3	3	
Sociology (Soc. 310)			3
Psychology (Ed. 300)	3		
Advanced Entomology (Ento. 400)	2	2	2
Thesis (Ento. 401)	4	4	4
Elective	6	8	8

College of Household and Industrial Arts

The courses offered in the College of Household and Industrial Arts are Applied Art, Home Economics and Secretarial Work.

The purpose of each of the courses is indicated by its title. The industrial application of the work is emphasized in each course. The applied art course and the secretarial work are open to both men and women. Several subjects taught in departments not represented in the College of Household and Industrial Arts are open to election by students on consent of their adviser.

APPLIED ART

The object of the applied art course is to prepare students for studio work as designers, craftsmen, or decorators, and also to prepare them to teach drawing and handicraft in elementary, grammar and high schools. The course includes the study of line, form, color, historic ornament, principles of design and composition, and technical methods in applied design. It insures a broad foundation of art culture and skill, which will enable students to make practical use of their training. Exceptional facilities are offered for the study of design and composition, and the course is strengthened by the many phases of related work.

HOME ECONOMICS

The primary purpose of the course in home economics is to prepare for the vocation of home making in its broadest sense. In addition this course opens up many other fields of work to its graduates. They may become teachers of any phase of home economics work in public schools, normal institutions, and colleges and the course is such as prepares them to teach other subjects, especially sciences. Other forms of work open are county and state extension positions; textile and clothing experts in the commercial fields; dormitory, cafeteria or lunch room managers in schools and state or commercial institutions and hospital dietitians.

All students are required to wear white cotton clothing while working in the food laboratories. A uniform style of dress is not required except the aprons which are all made by the use of Butterick Pattern No. 2776.

SECRETARIAL WORK

The course in secretarial work requires fifteen units of preparation, and extends through four years. The technical work is planned to be directly applicable to business, and broad enough to serve as a basis for such positions as private secretary, office manager, etc.

The course includes a thorough grounding in English and at least one modern language—French or Spanish, together with work in science, history, and social science. Women may elect some work in home economics. The technical work includes business procedure, office management and practice, business law, principles of accounting, principles underlying business activities, shorthand and type-writing.

The two-years secretarial course is intended for those who cannot take the time to complete a four-years course. The completion of a high school course or its equivalent is required for entrance.

COURSE IN APPLIED ART

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	2	3	3
French (French 101, 102, 103) or			
Spanish (Span. 120, 121, 122)	4	4	4
Drawing (Art 100, 101, 102)	3	4	4
General Botany (Bot. 100)		5	
Painting (Art 106)			4
Perspective (Art 105)	4		
Composition (Art 107, 108, 109)	1	1	1
Home Living (H. E. 109, 110)	1	1	
Physical Education (Phys. Ed. 101, 102, 103)	1	1	1
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
French (French 200, 201, 202) or			
Spanish (Span. 220, 221, 222)	3-4	3-4	3-4
History of Art (Art 209, 210, 211)	3	3	3
Historic Ornament (Art 206, 207, 208)	4	3	3
Drawing (Art 200)		4	
Painting (Art 202)			4
Composition (Art 203, 204, 205)	1	1	1
Superficial Anatomy (Zool. 204)	3		
Physical Education (Phys. Ed. 201, 202, 203)	1	1	1

JUNIOR YEAR

Economics (Econ. 300, 301)	3	3	
Psychology (Ed. 300)	3		
Contemporary Literature (Eng. 311, 312, 313)	3	3	3
Painting (Art 301)	2		
Advanced Design (Art 305, 306, 307)	3	3	3
Drawing (Art 300)			4
Composition (Art 302, 303, 304)	1	1	1
Medieval History (Hist. 301, 302, 303)	3	3	3
Household Physics (Phys. 204)		5	
Elective			3-4

SENIOR YEAR

Sociology (Soc. 310)			3
Modern Drama (Eng. 305, 306, 307)	2	2	2
Advanced Design (Art 409, 410, 411)	3	3	3
Painting (Art 403, 404, 405)	3	3	3
Composition (Art 406, 407, 408)	1	1	1
Special Problem (Art 418, 419, 420)	3	3	3
Elective	5-6	5-6	3-4

COURSE IN HOME ECONOMICS

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	4
General Biology (Zool. 101)			6
Design (Art 110, 111)	3	2	
Textiles (H. E. 107, 108)		2	2
Clothing (H. E. 103, 104, 105)	3	3	3
Foods (H. E. 100, 101)	3	3	
Physical Education for Women (Phys. Ed. 101, 102, 103)	1	1	1
Home Living (H. E. 109, 110)	1	1	
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Agricultural Organic Chemistry (Chem. 207)	6		
Food Chemistry (Chem. 209)			5
Food Studies (H. E. 201)			4
Physiology (Zool. 201)		6	
Household Physics (Phys. 204)		5	
Food Preservation (H. E. 200)	3		
Millinery (H. E. 202)			3
House Planning (A. E. 293)			2
General Bacteriology (Bact. 201)	5		
Sanitary Bacteriology (Bact. 202)		3	
Physical Education for Women (Phys. Ed. 201, 202, 203)	1	1	1

JUNIOR YEAR

Psychology (Ed. 300)	3		
Modern Drama (Eng. 305, 306, 307)	2	2	2
House Furnishings (H. E. 309)		5	
Physiological Chemistry (Chem. 310)		5	
Designing and Draping (H. E. 302)	5		
Food Economics (H. E. 300)			4
Medieval History (Hist. 301, 302, 303) or			
American History (Hist. 451, 452, 453)	3	3	3
Economics (Econ. 300, 301)	3	3	
Elective	2-3		9

SENIOR YEAR

Contemporary Literature (Eng. 311, 312, 313)	3	3	3
Thesis (H. E. 402)		3	
Dietetics (H. E. 400)	6		
Needlecraft and Weaving (H. E. 311)			4
Sociology (Soc. 310)			3
Electives	9	12	8

COURSE IN HOME ECONOMICS FOR TEACHERS

JUNIOR YEAR

	Autumn	Winter	Spring
Special Methods (H. E. Ed. 314, 315)			
Psychology (Ed. 300)	3	3	3
Principles and Methods of Teaching (Ed. 304).....	3		
Development of Vocational Education (Ed. 303)			3
Designing and Draping (H. E. 302).....	5		
Advanced Dressmaking (H. E. 303)			4
Physiological Chemistry (Chem. 310)		5	
Food Economics (H. E. 300)			4
House Furnishing (H. E. 309)		5	
Home Nursing (H. E. 301)		2	
Economics (Econ. 300, 301)	3	3	
Child Care and Training (H. E. 305)	2		
Elective	2		4

SENIOR YEAR

Dietetics (H. E. 400)	6		
Household Administration (H. E. 401)		6	
Educational Psychology (Ed. 301)		3	
Sociology (Soc. 310)			3
*Teaching Practice (H. E. Ed. 407).....			
*Thesis (H. E. 402)			
English or History	3	3	3
Electives	6-9	6	9-12

*Teaching practice, three credits, and Thesis, three credits, are required during one quarter of the Senior year.

COURSE IN SECRETARIAL WORK

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	4
Modern Language	4	4	4
European History (Hist. 101, 102, 103)	3	3	3
Shorthand (Sec. 100, 101, 102)	2	2	2
Typewriting (Sec. 103, 104, 105)	1	1	1
Physical Education (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101 102, 103) ..	1	1	1
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Modern History (Hist. 251, 252, 253)	3	3	3
Principles of Accounting (Sec. 209, 210, 211)	3	3	3
Modern Language	3-4	3-4	3-4
Commercial Law (Sec. 207, 208)	3	3	
Business Correspondence (Sec. 206)			3
Shorthand (Sec. 200, 201, 202)	1	1	1
Typewriting (Sec. 203, 204, 205)	1	1	1
Physical Education (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203) ..	1	1	1

JUNIOR YEAR

Nineteenth Century Literature (Eng. 308, 309 310)	3	3	3
Economics (Econ. 300, 301)	3	3	
Elementary Analysis (Math. 104, 105, 106)	4	4	4
Industrial History (Hist. 375, 376, 377)	3	3	3
Office Practice (Sec. 300)			3
Advanced Accounting (Sec. 301, 302, 303)	3	3	3
Marketing (Econ. 322)			3

SENIOR YEAR

Contemporary Literature (Eng. 311, 312, 313)	3	3	3
American History (Hist. 451, 452, 453)	3	3	3
Salesmanship (Sec. 402, 403)	3	3	
Principles of Business (Sec. 400, 401)		3	3
Sociology (Soc. 310)			3
Psychology (Ed. 300)	3		
Electives	6	6	6

TWO YEARS' COURSE IN SECRETARIAL WORK

FRESHMAN YEAR

	Autumn	Winter	Spring
English Composition (Eng. 101, 102, 103)	3	3	3
General Chemistry (Chem. 101, 102, 103)	4	4	4
Modern Language	4	4	4
European History (Hist. 101, 102, 103)	3	3	3
Shorthand (Sec. 100, 101, 102)	2	2	2
Typewriting (Sec. 103, 104, 105)	1	1	1
Physical Education (Phys. Ed. 101, 102, 103)	1	1	1
Military Science for Men (Mil. Sci. 101, 102, 103)	1	1	1
College Education (Ed. 100)	0		

SOPHOMORE YEAR

Expository Composition (Eng. 201, 202, 203)	2	2	2
Modern History (Hist. 251, 252, 253)	3	3	3
Principles of Accounting (Sec. 209, 210, 211)	3	3	3
Modern Language	3-4	3-4	3-4
Commercial Law (Sec. 207, 208)	3	3	
Business Correspondence (Sec. 206)			3
Shorthand (Sec. 200, 201, 202)	1	1	1
Typewriting (Sec. 203, 204, 205)	1	1	1
Physical Education (Phys. Ed. 201, 202, 203)	1	1	1
Military Science for Men (Mil. Sci. 201, 202, 203)	1	1	1

Departments of Instruction

AGRICULTURAL EDUCATION

PROFESSOR, M. J. ABBEY

300. Vocational Agricultural Education. Winter. 3 cr.

For persons preparing to teach vocational agriculture under the provisions of the State and Federal Vocational Act. The meaning of vocational agricultural education, methods of instruction, projects community work, inspections and reports on various types of agricultural schools in the state.

301-302-303. Vocational Agricultural Education. Autumn, winter and spring. 4 cr.

Itinerant teacher training and follow-up instruction. For persons who are already engaged in teaching vocational agriculture.

304-305-306. Teaching Practice in Agriculture. Autumn, winter and spring. Continuous 12 cr. Two quarters of 8 cr. required.

The preparation of lesson plans, observation work and under supervision actually teaching secondary classes in agriculture for a period of not less than twenty-four weeks.

307. Administration of Vocational Education. 3 cr.

The fundamental problems of vocational education as they affect the social, political, religious and educational agencies of a community. The possibilities of vocational education in a typical rural community, and how to administer the work.

308. Cooperation and Extension Methods. Winter. 3 cr.

Practical preparation for community leadership and modern methods of cooperative enterprises in agriculture.

309. Cooperation and Extension Methods in the Field. Spring 3 cr.

An extension of course four for persons who desire special preparation for county agent positions. Students will be required to do field work with county agents and specialists, assist in extension schools and community meetings.

310-311-312. **Supervision.** Autumn, winter and spring. Continuous. 3 cr.

Itinerant supervision instruction for persons who are teaching in schools receiving aid under the State and Federal Vocational Act.

313. **Seminar and Thesis.** Spring. 3 cr.

Each student must prepare a suitable thesis upon some phase of agricultural education or a closely related subject. The seminar phase of the course will be in the nature of a review of phases of agricultural education taken up in other courses and an intensive study of recent developments in agricultural education.

AGRICULTURAL ENGINEERING

PROFESSOR, H. E. MURDOCK; INSTRUCTORS, R. M. MERRILL, JAMES R. BARKER, F. L. GRIFFIN.

101. **Farm Shop.** Spring. 3 cr. Fee \$2; deposit \$2. Mr. Griffin.

Drawing; carpentry; use and care of hand tools in carpentry; practice in working dimensions from blue prints.

Forge: Care and manipulation of fire; drawing; upsetting; bending; welding; repair of farm implements. Lab. 3.

201. **Farm Structures.** Autumn. 3 cr. Prerequisite Agricultural Engineering 101, Registration in Physics 221. Mr. Merrill.

Farm building construction, arrangement and use, materials, ventilation, lighting, heating, Lect. 2; lab. 1.

301. **Farm Shop—advanced.** Winter. 3 cr. Prerequisite Agricultural Engineering 101. Fee \$2; deposit \$2. Mr. Griffin.

Estimating bills of materials and cost; woodworking; tin work; concrete; metal work; drill press; bench work; forge work; general repair work. Lab. 3.

302. **Farm Machinery.** Winter. 3 cr. Prerequisites Agricultural Engineering 101, Physics 221. Mr. Merrill.

Development, construction, functions, and methods of operating, adjusting and repairing farm implements and machinery. Lect. 2; lab. 1.

303. Farm Motors. Winter. 3 cr. Prerequisite Agricultural Engineering 101, Physics 221. Fee \$2; deposit \$2. Mr. Merrill.

Operation, repair and adjustment of farm motors. Special emphasis placed on gasoline engines of the single cylinder stationary type. Lect. 1; lab. 2.

304. Tractor Operation. Spring. 3 cr. Fee \$2; deposit \$2. Mr. Merrill.

Construction; motor; tractor fuels; carburetion; ignition; lubrication; transmissions; drives; operation; troubles. Lect. 1; lab. 2.

305. Irrigation Water Supply. Winter. 3 cr. Open to juniors and seniors. Mr. Barker.

Sources of water supply, snow and rainfall; runoff; storage; pumping for irrigation; losses of water; location of irrigation systems. Lect. 3

306. Use of Irrigation Water. Autumn. 3 cr. Open to juniors and seniors. Mr. Murdock, Mr. Barker.

Irrigation compared with humid and dry land farming, relative cost, measurement and distribution of water, duty of water, measuring devices, methods of applying water. Lect. 2; lab. 1.

307. Irrigation Farming. Spring. 4 cr. Prerequisite Agricultural Engineering 306. Mr. Murdock, Mr. Barker.

Preparation of land for irrigation, machinery used, methods of irrigation, leveler, instruments used in laying out farms for irrigation; running laterals, rate of applying water, duty of water, waste, causes and prevention; alkali, swamps, drainage. Lect. 2; lab. 2.

308. Drainage. Spring. 3 cr. Open to juniors and seniors. Mr. Murdock, Mr. Barker.

Physical relations and interrelations in soils; effect of water supply on crop growth; excessive moisture; seepage and its control, farm drainage systems; kinds of drains; laying out drainage systems; drainage for irrigated lands. Lect. 3.

310. Thesis. 6 cr. Mr. Murdock.

Senior agricultural engineering students may prepare a thesis on some subject approved by the head of the department not later than November 15.

AGRONOMY

PROFESSOR, CLYDE MCKEE; ASSISTANT PROFESSOR, H. R. SUMNER;
INSTRUCTOR, I. J. JENSEN.

100. Agricultural Development. Autumn. 2 cr. Mr. McKee.

The development of agriculture, agriculture as a science and the relation of other sciences to agriculture are discussed in an effort to enable the student properly to appreciate the material gathered in the various courses. Lect. 2.

200. Field Crops. Autumn. 3 cr. Prerequisite Botany 100. Fee \$1; deposit \$1. Mr. Sumner.

The fundamental principles of plant life, the relationship between crop production and soil and climatic conditions. Wheat production in Montana, varieties, culture and harvesting methods. Classification and control of weeds. Lect. 2; lab. 1.

201. Field Crops. Winter. 4 cr. Prerequisite Agronomy 200. Fee \$1; deposit \$1. Mr. Sumner.

A continuation of Agronomy 200. The characteristics, varieties and cultural methods for oats, barley, rye, flax, buckwheat, and corn are studied. Special attention given to grain judging in the laboratory work. Lect. 2; lab. 2.

202. Forage Crops. Spring. 5 cr. Prerequisites Agronomy 200, 201. Fee \$1; deposit \$1. Mr. Sumner.

Characteristics and culture of grasses, clovers, and other forage crops. Hay and hay making, range management, dry and irrigated pastures and meadows and other special forage crop problems. Lect. 3; lab. 2.

300. Grain Inspection and Judging. Autumn. 3 cr. Prerequisites Agronomy 200, 201, 202. Fee \$1. Mr. Sumner.

Study of wheat milling and the milling value of different wheats. The Grain Standards Act and its organization. Federal Standards for grains. Practice judging and grading of grains. Lab. 3.

301-302-303. Thesis. Autumn, winter, and spring. Continuous. 6 cr. Prerequisites Agronomy 200, 201, 202, 311, 312. Mr. McKee.

Senior agronomy students may prepare a thesis on some subject approved by the head of the department not later than November 15.

304. Dry Land Farming. Autumn. 3 cr. Prerequisite Agronomy 311. Mr. Jensen.

Problems related to dry land farming with particular reference to Montana and northwestern states. Climate, soil, moisture conservation, tillage methods, cropping systems, and water requirements of crops and their adaptability to dry land conditions. Lect. 2; lab. 1.

305. Field Crop Improvement. Autumn. 3 cr. Prerequisites Agronomy 200, 201, 202, Zoology 302. Mr. McKee.

Principles of plant breeding and their application to the important field crops. Methods and results of crop improvement practiced by farmers and experiment station workers are discussed thoroughly. Lect. 3.

306. Principles of Agronomic Experimentation. Spring. 1 cr. Prerequisites Agronomy 305. Mr. Sumner.

Principles underlying successful agronomic experimentation. The investigational methods that have resulted in important contributions to agronomic science are reviewed and discussed. Lect. 1.

307-308-309. Field Experiments. Autumn, winter, and spring. Continuous. 6 cr. Prerequisites Agronomy 305, 306. Mr. McKee.

A practical course in which the student is brought into close contact with field methods used in the actual conduct of agronomic experiments.

310. Advanced Crops. Winter. 2 cr. Prerequisites Agronomy 200, 201, 202, 306. Mr. Sumner.

Crop production and classification not treated fully in other courses. Special crops such as cotton, tobacco, hemp, rice and root crops may also be studied. Lect. 2.

311. Principles of Soil Management. Autumn. 3 cr. Prerequisites Physics 221, Chemistry 207, Bacteriology 201. Mr. Jensen.

Origin, formation, and classification of soils with particular reference to Montana conditions. Study of the physical properties; influence of tillage, manure and crop rotations on soil, moisture; structure, temperature and aeration. Plant food requirements of crops and their adaptability to different soils. Soil survey and its importance. Lect. 2; lab. 1.

312. Principles of Soil Management. Winter. 3 cr. Prerequisite Agronomy 311. Mr. Jensen.

A continuation of the studies of Agronomy 311. Relationship of soil organisms and organic matter to fertility, influence of manure, fertilizers, and crop rotations on productive capacity of soil. Causes of acid and alkali conditions and their correction. Methods of increasing and maintaining soil fertility. Lect. 2; lab. 1.

313. Management of Special Soil Types. Spring. 3 cr. Prerequisite Agronomy 311. Mr. Jensen.

Methods of handling alkali, gumbo, sandy, heavy, clay, muck, peat, and worn-out soils; special soil problems of irrigated and dry farms. Lect. 3.

314. Seminar. Spring. 1 cr. Prerequisite senior classification. Mr. McKee.

Students are required to review and present before the class timely agronomic articles appearing in bulletins and current periodicals. Required of all Agronomy Students. Lect. 1.

ANIMAL HUSBANDRY

PROFESSOR, C. N. ARNETT; ASSISTANT PROFESSORS, R. C. McCHORD, W. E. JOSEPH. INSTRUCTORS, J. O. TRETSVEN, A. L. McMAHON.

101. Livestock Judging. Autumn. 3 cr. Fee \$1. Mr. McChord.

Beef cattle and sheep. Scoring individuals, judging groups, study of livestock markets and market classifications. Lab. 3.

102. Livestock Judging. Winter. 3 cr. Fee \$1. Mr. McChord.

Horses, swine and dairy cattle. Scoring individuals, judging groups, study of livestock markets and market classifications. Lab. 3.

201. Breeds of Livestock. Winter. 4 cr. Prerequisite Animal Husbandry 101. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of beef cattle and sheep; judging breed types. Lect. 3; lab. 1.

202. Breeds of Livestock. Spring. 4 cr. Prerequisite Animal Husbandry 102. Fee \$1. Mr. McChord.

Origin, history, characteristics and adaptability of horses, swine, and dairy cattle; judging breed types. Lect. 3; lab. 1.

203. Principles of Feeding. Autumn. 2 cr. Mr. Arnett.

Study of feeds, feeding standards, calculating rations and general principles of feeding all classes of livestock. Lect. 2.

301. Advanced Stock Judging. Autumn. 2 cr. Prerequisites Animal Husbandry 201, 202. Fee \$1. Mr. McChord.

Continuation of judging and study of market and breeding stock. Beef cattle, sheep, horses and swine. Lab. 2.

302. Nutrition of Farm Animals. Winter. 4 cr. Prerequisite Chemistry 207. Mr. Joseph.

Digestion, metabolism, enzyme changes, functions of nutrients, compounding rations, feeding standards, feeds, their uses and adaptability in the ration. Lect. 4.

303. Handling and Fitting Livestock. Spring. 2 cr. Prerequisites Animal Husbandry 201, 202. Fee \$2. Mr. McChord, Mr. Tretsvén.

Fitting and handling livestock for show, sale, breeding and work. Lab. 1.

304. Breeding Farm Animals. Spring. 3 cr. Prerequisites Animal Husbandry 201, 202. Zoology 302. Fee \$1. Mr. McChord.

Principles and practices of breeding farm animals, tabulation and study of pedigree. Lect. 3; lab. 1.

305. Beef Cattle and Sheep Production. Winter. 4 cr. Prerequisites Animal Husbandry 201, 203, Chemistry 208. Mr. Arnett.

Feeding, care and management of purebred and grade beef cattle and sheep. Lect. 4.

306. Horses and Swine Production. Spring. 2 cr. Prerequisites Animal Husbandry 202, 203, Chemistry 208. Mr. Arnett.

Feeding, care and management of purebred and grade horses and swine. Lect. 2.

307. Dairy Production. Spring. 3 cr. Prerequisites Animal Husbandry 203. Mr. Tretsvén.

Feeding, care and management of dairy stock for breeding and milk production. Lect. 3.

308. **Experimental Feeding.** Winter. 3 cr. Prerequisites Animal Husbandry 302, 305. Mr. Joseph.

Methods, principles and results of experimental work in animal husbandry. Lect. 2; lab. 1.

309. **Thesis.** Winter and spring. Mr. Arnett.

Animal husbandry students may select thesis work during the senior year.

310. **Advanced Judging and Pedigree Study of Dairy Cattle.** Spring. 2 cr. Fee \$1. Prerequisites Animal Husbandry 102, 202. Mr. Tretsven.

A continuation of judging work as given in 102 and 202 with special emphasis placed on judging groups; detailed study and tabulation of pedigrees of different breeds. Lab. 2.

311-312. **General Agricultural Seminar.** Autumn and Winter. 2 cr. Mr. Arnett.

General agricultural seminar, required of all students in agriculture.

313. **Animal Husbandry Seminar.** Spring. 1 cr. Mr. Arnett.

Review and presentation of current animal husbandry subjects. Required of all animal husbandry students.

APPLIED ART

ASSISTANT PROFESSOR, OLGA ROSS HANNON; INSTRUCTORS, SALLIE GILLESPIE, HELEN LUND.

100-101-102. **Freehand Drawing.** Autumn, winter and spring. Continuous. 11 cr. Fee \$.50. Miss Lund.

Drawing from objects and nature in pencil, pen and ink, and color. Adaptation of naturalistic forms to abstract design. Lab. 3 or 4.

103-104. **Analytic Drawing from Nature.** Autumn or spring. 2 cr. Fee \$.50. Miss Lund.

Intended especially for students whose major work is in science. Drawing of still life, apparatus, flowers, leaves, insects. Rendered in pencil, pen and ink, charcoal, wash and color. Lab. 2.

105. **Perspective.** Autumn. 4 cr. Fee \$.50. Miss Gillespie.

Principles of cylindrical and angular perspective illustrated in freehand sketches. Lab. 4.

106. **Painting.** Spring. 4 cr. Prerequisite Art 102. Fee \$.50 Miss Gillespie.

Principles of dynamic symmetry. Application of theory in landscape and still life. Black, white and color. Lab. 4.

107-108-109. **Composition.** Autumn, winter and spring. Continuous. 3 cr. Fee \$.50. Mrs. Hannon, Miss Gillespie, Miss Lund.

Criticisms of work done independently from given subjects. Lect. 1.

110-111. **Design.** Autumn and winter. 5 cr. Fee \$.50 Miss Lund.

Course given for home economics freshmen. Principles of structural elements in design. Color theory. Application of principles of design in black, white, and color. Making of useful articles. Lab. 2 or 3.

200. **Freehand Drawing.** Winter. 4 cr. Fee \$.50. Miss Lund.

Continuation of Art 102. Lab. 4.

201. **Analytic Drawing from Nature.** Autumn. 3 cr. Fee \$.50. Prerequisite Art 103 or 104. Miss Lund.

Continuation of Art 103 or 104. Lab. 3.

202. **Painting.** Spring. 4 cr. Fee \$.50. Mrs. Hannon.

Continuation of principles taught in Art 106. Lab. 4.

203-204-205. **Composition.** Autumn, winter and spring. Continuous. 3 cr. Fee \$.50. Mrs. Hannon, Miss Gillespie, Miss Lund.

Criticisms of work done independently from given subjects. Lect. 1.

206-207-208. **Historic Ornament.** Autumn, winter and spring. 10 cr. Fee \$.50. Miss Gillespie.

Design of historic ornament with analysis of historic examples of design. Designs based on the principles of historic ornament executed in black, white and color. Lab. 2 or 3.

209-210-211. **History of Art.** Autumn, winter and spring. Continuous. 9 cr. Mrs. Hannon.

Study of development of art, architecture, sculpture, and painting from the prehistoric period to the present. Lect. 3.

300. **Freehand Drawing.** Spring. 4 cr. Fee \$.50. Miss Lund. Lab. 4.

301. **Painting.** Autumn. 2 cr. Fee \$.50. Miss Gillespie.

Application of the principles of dynamic symmetry in decoration landscapes and painting from the costumed model. Black, white and color. Lab. 2.

302-303-304. **Composition.** Autumn, winter and spring. Continuous. 3 cr. Fee \$.50. Mrs. Hannon, Miss Gillespie, Miss Lund.

Criticism of work done independently from given subjects. Lect. 1.

305-306-307. **Advanced Design.** Autumn, winter and spring. 9 cr. Fee \$.50. Mrs. Hannon.

Continuation of Art 207. Commercial designs executed to meet the requirements of reproduction. Lab. 3.

308. **Costume Design.** Autumn, winter, and spring. 6 cr. Prerequisite Art 110. Fee \$.50. Mrs. Hannon.

History of costume, study of line, form and color in relation to the figure and to costume. Elective course for juniors and seniors in the home economics and art courses. Lab. 2.

309. **Interior Decoration.** Autumn winter and spring. 6 cr. Fee \$.50. Mrs. Hannon.

Planning of the modern house in relation to the site, type of house, building material, ventilation, light, arrangement of rooms. Study of furniture, period furniture and its modern adaptation. Study of draperies, rugs and wall coverings. Scientific study of color in relation to the house. Lab. 2.

310. **Metal.** Winter. 2 to 4 cr. Fee \$.50. Mrs. Hannon.

Work in copper, brass and silver. Raising, saw-piercing, etching, soft and hard soldering and riveting. Lab. 2 or 4.

311. Basketry. Winter. 2 cr. Fee \$3. Mrs. Hannon.

Making of baskets of reed and raffia, and other suitable materials. Dye and dyeing baskets. Use of native materials in inventing weaves in basketry. Lab. 2.

400-401-402. Freehand Drawing. Autumn, winter and spring. 3 to 9 cr. Fee \$.50. Miss Gillespie.

Drawing from costume model and sketching from nature. Elective course for seniors in art. Lab. 2 or 3.

403-404-405. Painting. Autumn, winter and spring. 9 cr. Fee \$.50. Mrs. Hannon.

Continuation of Art 301—Water color and oil. Lab. 3.

406-407-408. Composition. Autumn, winter and spring. Continuous. 3 cr. Fee \$.50. Mrs. Hannon, Miss Gillespie, Miss Lund.

Criticism of work done independently from given subjects. Lect. 1.

409-410-411. Advanced Design. Autumn, winter and spring. 9 cr. Fee \$.50. Mrs. Hannon.

412-413-414. Methods. Autumn, winter and spring. 6 cr. Fee \$.50. Mrs. Hannon.

Methods of teaching art in public schools. Lab. 3.

415-416-417. Practice Work in Teaching. Autumn, winter and spring. 6 cr. Prerequisite Art 414. Mrs. Hannon.

418-419-420. Special Problem. Autumn, winter, and spring. 9 cr. Fee \$1. to \$5. Mrs. Hannon. Open only to applied art seniors.

Each student develops a project through research work and invention. Record and examples to be left in the studio for benefit of other students.

421. Leather. Autumn, or winter, or spring. 2 cr. Prerequisites Art 206, 207, 208. Fee \$3. Mrs. Hannon.

Tooling, modeling and embossing; also use of dyes and stains for leather. Lab. 2.

422. Jewelry. Autumn, winter and spring. 6 to 12 cr. Fee \$3. Prerequisite Art 207. Mrs. Hannon.

Making of jewelry in copper and silver, saw-piercing, repousse, enameling and the setting of semi-precious stones. Lab. 2 or 4.

ARCHITECTURAL ENGINEERING

PROFESSOR, W. R. PLEW; LECTURER, FRED F. WILLSON; INSTRUCTORS, H. C. CHEEVER, W. V. MARSHALL.

101. **Architectural Drawing.** Autumn. 2 cr. Mr. Cheever.

Freehand drawing from casts in charcoal. Lab. 2.

102. **Architectural Drawing.** Winter. 2 cr. Prerequisite Architectural Engineering 101. Mr. Cheever.

Drawing of architectural details in pen and ink and wash. Lab. 2.

103. **Architectural Drawing.** Spring. 2 cr. Prerequisite Architectural Engineering 102. Mr. Cheever.

Sketching in pencil from architectural details and from nature. Lab. 2.

181-182-183. **Seminar.** Autumn, winter and spring. Continuous. 3 cr. Mr. Plew.

Freshmen students are required to attend the weekly seminar without credit.

201. **Architectural Drawing.** Autumn. 3 cr. Prerequisite Architectural Engineering 103. Mr. Cheever.

Study of color as applied to architectural design. Sketching work from nature executed in color. Lab. 3.

211. **Working Drawings.** 3 cr. Prerequisite Engineering Drawing 101. Mr. Cheever.

A systematic study of the characteristic properties of wood and wood framing; building details. Lab. 3.

212. **Specifications and Working Drawings.** Winter. 3 cr. Prerequisite Architectural Engineering 211. Mr. Cheever.

Making complete working drawings for a frame residence with specifications. Lab. 3.

221-222-223. **History of Architecture.** Autumn, winter and spring. Continuous. 6 cr. Mr. Willson.

History of architecture as a record of civilization up to the Gothic. Lect. 2.

233. **Elementary Design.** Spring. 3 cr. Prerequisite Architectural Engineering 201. Mr. Cheever.

Study of orders in detail; rendering in India ink. Lab. 3.

281-282-283. Seminar. Autumn, winter and spring. Continuous. 3 cr. Mr. Plew.

Sophomore students are required to attend the weekly seminar without credit.

293. House Planning. Spring. 2 cr. Mr. Cheever.

An elementary course in house planning for home economics students. Lab. 2.

312. Specifications and Working Drawings. Winter. 3 cr. Prerequisite Architectural Engineering 212. Mr. Cheever.

Making complete plans for a small masonry building with specifications. Lab. 3.

313. Building Sanitation. Spring. 2 cr. Mr. Plew.

Designing of plumbing installations; traps, water-closets, private systems of water supply, and sewage disposal. Lect. 2.

321-322-323. History of Architecture. Autumn, winter and spring. Continuous. 6 cr. Mr. Willson.

A continuation of architectural engineering 221, 222, 223, beginning with Gothic and covering all periods down to modern architecture. Lect. 2.

331. Design. Autumn. 4 cr. Prerequisite Architectural Engineering 233. Mr. Cheever.

Plans and sketch problems; presentation.

332. Design. Winter. 4 cr. Prerequisite Architectural Engineering 231. Mr. Cheever.

Continuation of architectural engineering 331.

333. Design. Spring. 3 cr. Prerequisite Architectural Engineering 231. Mr. Cheever.

A continuation of architectural engineering 332 to include some structures of monumental character.

341. Graphics. Autumn. 3 cr. Prerequisite Civil Engineering 220. Mr. Marshall.

Fundamentals of graphic statics; roof and bridge trusses; dead and moving loads. Lab. 3.

342. Graphics. Winter. 3 cr. Prerequisite Architectural Engineering 341. Mr. Marshall.

Continuation of architectural engineering 341. Secondary stress-
es. Lab. 3.

343. **Graphics.** Spring. 2 cr. Prerequisite Architectural Engineering 342.

Continuation of architectural engineering 342; one, two and three hinged arch trusses; vaults, domes. Lab. 2. Mr. Marshall.

381-382-383. **Seminar.** Autumn, winter and spring. Continuous. 3 cr. Mr. Plew.

Junior students are required to prepare and present papers upon assigned architectural or engineering topics at the weekly seminar period.

411. **Estimating.** 3 cr. Prerequisite Architectural Engineering 312. Mr. Plew.

Estimating of building costs, by quantity method. Lect. 3.

413. **Building Specifications.** Spring. 3 cr. Prerequisite Architectural Engineering 312. Mr. Plew.

A study of various specifications for good building; compiling a complete set of specifications.

451. **Steel Mill Buildings.** Spring. 2 cr. Prerequisite Architectural Engineering 341. Mr. Plew.

Design of steel roof trusses; framed bents; mill building details. Lab. 3.

452. **Architectural Engineering.** Winter. 2 cr. Prerequisite Architectural Engineering 451. Mr. Plew.

Design of steel frame work in modern building construction; fireproof construction steel. Lab. 2.

462. **Architectural Engineering.** Winter. 3 cr. Prerequisite Civil Engineering 343.

Principles of concrete design applied to warehouse or construction. Lab. 3.

463. **Architectural Engineering.** Spring. 2 cr. Prerequisite Architectural Engineering 462. Mr. Plew.

A continuation of architectural engineering 462.

466. **Architectural Engineering.** Spring. 3 cr. Prerequisite Architectural Engineering 462. Mr. Plew.

A continuation of architectural engineering 462 to include the modern fireproof concrete building; flat slab.

472-473. **Thesis.** Winter and spring. 7 cr. Mr. Plew.

A complete design of some moderate sized public building. Lab. 4.

481-482-483. **Seminar.** Autumn, winter and spring. Continuous. 3 cr. Mr. Plew.

Senior students are required to prepare and present papers upon assigned architectural or engineering topics at the weekly seminar period.

BOTANY AND BACTERIOLOGY

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON. ASSISTANT, W. N. CHRISTOPHER.

100. **General Botany.** Winter. 5 cr. Fee \$2; deposit \$2. Mr. Swingle, Mr. Jennison, Mr. Christopher.

A brief study of the lower forms of plant life, followed by a detailed study of the structure, physiology, and classification of seed plants, especially those of economic importance. Lect. 3; lab. 2.

101. **Systematic Botany.** Spring. 5 cr. Prerequisite. Botany 100. Fee \$3. Mr. Swingle, Mr. Christopher.

Principles and methods used in classification, especially those that apply to seed plants. Lectures, demonstrations, field and laboratory work to familiarize the student with Montana flora, including weeds that have been introduced from other regions. Lect. 2; lab. 3.

200. **Morphology and Histology.** Autumn. 5 cr. Prerequisite Botany 100. Fee \$4; deposit \$2. Mr. Swingle, Mr. Jennison.

Form and structure of plants, especially those below the seed plants. Lect. 2; lab. 3.

201. **General Bacteriology.** Autumn 5 cr. Prerequisites Chemistry 101, one course in Botany or Zoology. Fee \$4; deposit \$3. Mr. Swingle, Mr. Christopher.

Structure, physiology and classification of bacteria, their growth in nutriment media, and methods of bacteriological technique. Relation of bacteria to agriculture, to human and animal pathology, to the arts and industries. Lect. 2; lab. 3.

202. **Sanitary Bacteriology.** Winter, 3 cr. Prerequisite Bacteriology 200 or 300. Mr. Swingle.

Treating of infectious diseases. Sources and modes of infection. Methods of disease prevention for self-protection and the protection of others. Lect. 3.

203. Microbiology of Waters. Spring 5 cr. Prerequisite Bacteriology 200 or 300. Fee \$4; deposit \$4. Mr. Swingle, Mr. Christopher.

Micro-organisms in relation to the sanitary qualities of waters. Given in odd years only. Lect. 2; lab. 3.

204. Microbiology of Foods. Spring 5 cr. Prerequisite Bacteriology 200 or 300. Fee \$4; deposit \$4. Mr. Swingle, Mr. Christopher.

Bacteria and fungi in relation to food spoilage, food preservation and food manufacture. Given only in even years. Lect. 2; lab. 3.

300. Plant Physiology. Spring, 6 cr. Prerequisites Botany 100, Physics 221, 214, 215, Chemistry 207 or 311-312-313. Fee \$3; deposit \$3. Mr. Jennison.

Nutrition, growth, reproduction and movement in plants especially the higher forms. Lect. 3; lab. 2.

301. Plant Pathology. Autumn. 6 cr. Prerequisites Botany 100, Bacteriology 200 or 300. Fee \$3. Mr. Jennison.

Plant disease, including the relations of host and parasite, methods of control and the nature of diseases not caused by parasites. Lect. 3; lab. 3.

302. Agricultural Bacteriology. Winter. 4 cr. Prerequisites Chemistry 101, one course in Botany or Zoology. Fee \$4; deposit \$2. Mr. Christopher.

Fundamental principles of bacteriology, followed by the application of this subject to soils, dairying, silage, sanitation, etc. Lect. 2; lab. 2.

400. Mycology. Winter. 5 cr. Prerequisite Botany 100. Fee \$3. Mr. Jennison.

A comparative study of the structure, physiology and classification of fungi. Lect. 2; lab. 3.

401. Bacteriological Methods. Spring. 5 cr. Prerequisites Bacteriology 200 or 300 and Zoology 201 or Veterinary Science 301. Fee \$4; deposit \$5. Mr. Christopher.

The technique involved in the study and identification of micro-organisms, laboratory diagnosis, and immunology, Lect. 2; lab. 3.

402-403-404. Seminar. Autumn, winter and spring. 3 cr. Mr. Swingle, Mr. Jennison, Mr. Christopher.

Abstracts and reviews of journal articles, books, etc. Lect. 1.

405. **Thesis.** Credits variable. Fee \$1; deposit \$4. Mr. Christopher.

Open to seniors in the botany and bacteriology course, and to others who have had sufficient preparation.

CHEMISTRY AND CHEMICAL ENGINEERING

PROFESSOR, W. M. COBLEIGH. ASSISTANT PROFESSORS, L. S. WELLS, E. J. QUINN. INSTRUCTOR, E. S. WILSON. ASSISTANTS, L. W. SALTZ, S. G. SCOTT, FRANK WARE. SPECIAL LECTURERS, E. BURKE, Chief Chemist of Experiment Station, Agricultural Chemistry; M. J. BLISH, Research Chemist, Experiment Station, Protein Chemistry; W. H. ANDREWS, Chief Chemist, Three Forks Portland Cement Company, Clays and Cement Making Materials.

101-102-103. **General Chemistry.** Autumn, winter and spring. Continuous, 12 or 14 credits. Fee \$4; deposit \$4. Mr. Cobleigh, Mr. Wilson, Mr. Saltz, Mr. Scott.

Fundamental laws of chemistry, the descriptive chemistry of the elements and their compounds, and elementary qualitative analysis. Lect. 2; lab. 2.

105-106-107. **Seminar.** Autumn, winter and spring. Continuous. 3 cr. Mr. Cobleigh.

Serves the purpose of a so-called orientation course designed to give the freshmen in chemistry and chemical engineering an appreciation of the field of chemistry in practical affairs, and to give them a more adequate outlook on the training required by professional chemists.

203. **Qualitative Analysis.** Autumn. 5 cr. Prerequisite Chemistry 101-102-103. Fee \$4; deposit \$4. Mr. Wilson.

The course is presented from the standpoint of modern theories of chemistry. Lect. 3; lab. 2.

204-205. **Quantitative Analysis.** Winter and spring. 10 cr. Prerequisite Chemistry 203. Fee \$4; deposit \$4. Mr. Scott.

Theory and technique of the methods of analytical chemistry and chemical calculations. Lect. 2; lab. 3.

207. Agricultural Organic Chemistry. Autumn. 6 cr. Prerequisites Chemistry 101-102-103. Fee \$4; deposit \$4. Mr. Wells.

Compounds of the aliphatic and aromatic series and organic materials of interest to students of agriculture and home economics. Lect. 4; lab. 2.

208. Agricultural Chemistry. Winter. 6 cr. Prerequisites Chemistry 101, 102, 103. Fee \$6; deposit \$4. Mr. Quinn.

Composition and reaction of soils, preparation and valuation of fertilizers, insecticides, and fungicides, examination of feeding stuffs and of dairy products, and problems of farm sanitation. Lect. 4; lab. 2.

209. Food Chemistry. Spring. 5 cr. Prerequisite Chemistry 207. Fee \$4; deposit \$4. Mr. Wells.

Composition of foods, food production and preservation, food legislation and inspection. Lect. 3; lab. 2.

301-302-303. Quantitative Analysis. Autumn, winter and spring. Continuous. 12 or 15 cr. Prerequisites Chemistry 204, 205. Fee \$4; deposit \$4. Mr. Quinn.

A continuation of Chemistry 204, 205. Analysis of organic substances and agricultural products. Elective for students in agriculture and home economics. Lect. 2; lab. 2. Lect. 2; lab. 3.

310. Physiological Chemistry. Winter. 5 cr. Prerequisite Chemistry 207. Fee \$4; deposit \$4. Mr. Wells.

Functions of fats, carbohydrates, protein and salts in nutrition, together with a study of the chemistry of digestion and metabolism. Lect. 3; lab. 2.

311-312-313. Organic Chemistry. Autumn, winter and spring. Continuous. 15 cr. Prerequisite Chemistry 101, 102, 103, 203. Fee \$4; deposit \$4. Mr. Wells.

Compounds of the aliphatic and aromatic series and organic preparations. Lect. 3; lab. 2.

321-323. Engineering Chemistry. Autumn and spring. 2 and 4 cr. Prerequisites Chemistry 204, 205. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemistry and production of lime, mortar, cement, refractory materials, iron, steel, and copper. Qualitative and approximate quantitative examinations of the materials listed above, as an aid in studying their chemical properties. Lect. 2; lab. 1. Lect. 2; lab. 2.

330-331. **Physical Chemistry.** Winter and spring. 10 cr. Prerequisites Chemistry 204-205. Mathematics 5 or 16. Fee \$4; deposit \$4. Mr. Wells.

Theoretical chemistry, including stoichiometry, radio-activity, the electron theory, the gas laws, kinetic theory of gases, liquids, solids, colloids, osmotic pressure, theory of solution, and the phase rule. Lect. 3; lab. 2.

341-342-343. **Seminar.** Autumn, winter and spring. Continuous. 3 cr. Mr. Wells. Mr. Cobleigh.

Each student will be required to make abstracts of articles on assigned subjects from the leading journals and present them at weekly meetings of the students and department instructors, where the topics are discussed. Lect. 1.

401-402-403. **Industrial Chemistry.** Autumn, winter and spring. Continuous. 15 cr. Prerequisites Chemistry 203, 204, 205, 311, 312, 313. Fee \$4; deposit \$4. Mr. Cobleigh.

The application of chemistry to the industries, including operations common to many chemical industries, such as crushing, grinding, calcination, fusion, distillation, crystallization, etc., and types of machinery used in these operations. Inspections and reports on various industrial plants in the state. The laboratory work in the spring quarter is taught from the viewpoint of chemical engineering. Lect. 3; lab. 2.

414. **Fuel and Oil Analysis.** Winter or spring. 3 cr. Prerequisites Chemistry 204, 205. Fee \$4; deposit \$4. Mr. Cobleigh.

Production and analysis of solid, liquid, and gaseous fuel, illuminating gas and lubricating oils. Lect. 1; lab. 2.

415. **Water Analysis.** Winter or spring. 4 cr. Prerequisite Chemistry 101, 102, 103, 204, 205. Fee \$4; deposit \$4. Mr. Cobleigh.

Chemical examination of potable waters, of water for industrial purposes and steam raising, of sewage and of air. Water purification and softening, and sewage treatment. Lect. 2; lab. 2.

427. **Electro Chemistry.** Autumn. 5 cr. Prerequisite Chemistry 330, 331. Fee \$2; deposit \$2.

Including the following topics: Electrical conductance, equilibrium, hydrolysis, electromotive force, electrolysis, polarization, electro-analysis, electroplating, electric furnaces, applied electrochemistry.

430. **Thesis.** Autumn, winter and spring. Continuous. 6 cr. Mr. Cobleigh, Mr. Wells, Mr. Quinn.

Students in the chemistry course may, in the senior year, prepare a thesis on some subject which will involve considerable laboratory work and originality. Lab. 2.

431. **Soil Chemistry.** Spring. 1 cr. Prerequisites Chemistry 207 or 311, 312, 313, 204, 205. Mr. Burke.

Soil-forming rocks, rock weathering, classification of soils, elements essential to plant growth, soil analysis, interpretation of soil analysis. Origin, classification and toxicity of alkali salts. Lect. 1.

433. **Chemistry of Proteins.** Spring. 1 cr. Prerequisites Chemistry 311, 312, 313.

Occurrence, origin and chemical constitution of proteins. General and physical properties of proteins, and quantitative methods of estimating the units of the protein molecule. Application of the physical and chemical properties of proteins to biology and nutrition. Lect. 1.

CIVIL ENGINEERING

PROFESSOR, L. D. CONKLING. ASSISTANT PROFESSORS, E. L. GRANT, ALFRED LUDWIG.

101-102-103. **Surveying.** Autumn, winter and spring. 6 cr. Fee \$1; deposit \$2. Mr. Grant.

Field practice in the use of the transit, level, steel tape, and traverse plane table. Adjustment and care of instruments. Surveying computations. Lab. 2.

104. **Surveying.** Autumn. 2 cr. Fee \$1; deposit \$2. Mr. Grant.

A short course in the theory, adjustment and use of instruments. Alignment, leveling, measurements by tape and stadia. Computations of areas. Platting. Lab. 2.

201. **Surveying.** Autumn. 6 cr. Fee \$1; deposit \$2. Mr. Grant.

Topographic surveying by the stadia method, with transit and plane table. Field work and computations for simple curves and earth work. Map drafting. Lect. 2; lab. 4.

202-203. Surveying. Winter and spring. 4 cr. Fee \$1; deposit \$2. Mr. Grant.

Use, care and adjustment of surveying instruments. Topographic mapping. For electrical engineering students. Lab. 2.

210. Highway Engineering. Winter. 3 cr. Prerequisite Civil Engineering 201. Mr. Conkling.

Preliminary investigations; surveying, mapping and design; grading, drainage, and foundations. Lect. 3.

220. Statics. Winter. 3 cr. Prerequisites Physics, 201, 202, 203, 207, 208, 209. Mr. Grant.

Force systems in equilibrium. Lect. 3.

221. Dynamics. Spring, 3 cr. Prerequisite Civil Engineering 220. Mr. Grant.

Rectilinear and curvilinear motion. Work, energy, power, impulse, and momentum. Lect. 3.

301. Precise Surveying. Autumn. 3 cr. Prerequisite Civil Engineering 201. Mr. Ludwig.

Study of the different methods of making topographic and hydrographic surveys. Control of the survey. Topographic details. Hydrographic surveying. Mapping. Lab. 3.

310. Highway Engineering. Autumn. 4 cr. Prerequisite Civil Engineering 210. Mr. Conkling.

Roads and paving materials. Their inspection and laboratory tests. Surveys for road and street improvements. Lect. 1; lab. 3.

311. Highway Engineering. Winter. 4 cr. Prerequisite Civil Engineering 310. Mr. Conkling.

Roads and pavements, design; contracts and specifications; methods of financing; organization and administration; legislation and state laws. Lect. 2; lab. 2.

320. Mechanics of Materials. Autumn. 5 cr. Prerequisite Civil Engineering 221. Mr. Conkling.

Elasticity and strength of timber, brick, stone, and metals. Theory of beams, columns, and shafts. Lect. 5.

321. Strength of Materials. Autumn or winter. 1 cr. Prerequisite Civil Engineering 320. Fee \$2; deposit \$2. Mr. Conkling.

Experimental determinations of the strength and of the several moduli of the more important of the materials of engineering. Lab 1.

330. Hydraulics. Winter. 4 cr. Prerequisites Mathematics 201, 202, 203, Physics 201, 202, 203, 207, 208, 209. Mr. Grant.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Lect. 4.

331. Hydraulic Laboratory. Spring. 1 cr. Prerequisite Civil Engineering 330. Fee \$2; deposit \$2. Mr. Grant.

Flow of water over weirs, through nozzles and pipes, open channels and conduits, etc. Lab. 1.

332. Hydraulic Engineering. Spring. 3 cr. Mr. Grant.

Theoretical hydraulics, hydraulic measurements; flow of water through orifices, over weirs, through pipes, conduits and canals. Fundamental theory of water wheels and water power development. For electrical engineering students. Lect. 3.

333. Hydraulic Engineering. Spring. 6 cr. Prerequisite Civil Engineering 330. Mr. Conkling.

Precipitation, drainage area, runoff, storage, public water supply, reservoirs, pipe lines, pumping plants, purification plants, power development, etc., Lect. 4; lab. 2.

334. Elementary Hydraulics. Spring. 2 cr. Prerequisites Mathematics 201, 202, 203, Physics 201, 202, 203, 207, 208, 209. Mr. Conkling.

Elementary course in theoretical hydraulics for students in architectural engineering. Course given each alternate year beginning February, 1920.

340. Graphic Statics. Autumn. 3 cr. Prerequisite Civil Engineering 221. Fee \$1; deposit \$2. Mr. Conkling.

Stresses in roof trusses by the force polygon. Application of equilibrium polygon to beams and girders. Stresses in bridge trusses, retaining walls and masonry arches. Lab. 3.

341. Roofs and Bridges. Winter. 4 cr. Prerequisite Civil Engineering 320. Mr. Ludwig.

Theory and computation of stress in roof and bridge trusses under dead, live, and wind loads. Locomotive wheel loads on plate girders and bridge trusses. Lect. 4.

342. Bridge Design. Spring. 5 cr. Prerequisite Civil Engineering 341. Mr. Ludwig.

Designing of girders and trusses; computation and complete drawings for a through plate girder railroad bridge, and for a highway truss bridge. Specifications, bill of materials and estimate of cost. Lect. 1; drawing 4.

343. Concrete Design. Autumn. 4 cr. Prerequisite Civil Engineering 342. Deposit \$2. Mr. Ludwig.

Design of reinforced concrete beams and slabs, reinforced concrete buildings and other structures. Lect. 1; lab. 3.

344. Concrete Design. Winter. 4 cr. Prerequisite Civil Engineering 343. Deposit \$2; Mr. Ludwig.

Theory and design of reinforced concrete dams and retaining walls. Lect. 1; lab. 3.

345. Foundations and Masonry. Spring. 3 cr. Prerequisite Civil Engineering 344. Mr. Conkling.

Materials and methods employed in the construction of piers, abutments, masonry dams, retaining walls and foundations; economy of construction; specifications and costs. Lect. 3.

346. Cement Laboratory. Winter. 2 cr. Prerequisite Civil Engineering 320. Fee \$2; deposit \$2. Mr. Conkling.

Manufacture and properties of hydraulic cement, proportioning and mixing concrete. Standard tests of sand and cement. Test of concrete beams, etc. Lab. 2.

350. Railroad Engineering. Spring. 3 cr. Prerequisite Civil Engineering 201. Fee \$1; deposit \$2. Mr. Ludwig.

Railroad reconnoissance, preliminary and location surveys. Railroad structures, simple and compound curves, easement curves and transition spirals, simple and compensated grades, switches, turnouts, and crossings. Lab. 3.

351. Railroad Economics. Autumn. 3 cr. Prerequisite Civil Engineering 350. Fee \$1; deposit \$2. Mr. Ludwig.

Making of profiles, field maps, cross-sections, etc., from students' notes of the field work. Economics of railroad location; arrangement of yards, terminals, and stations. Making location map. Construction of the road bed. Maintenance of way and the elements of railroad operation. Lect. 1; lab. 2.

360. Irrigation Engineering. Autumn. 3 cr. Prerequisite Civil Engineering 330. Mr. Grant.

History of irrigation; the principles of irrigation and location of irrigation systems. Lect. 3.

361. Irrigation Engineering. Winter 3 cr. Prerequisite Civil Engineering 360. Mr. Grant.

Manner of supplying, storing, conveying and distributing irrigation water; management of irrigation systems; irrigation laws. Lab. 3.

362. Canal Surveying. Autumn. 3 cr. Prerequisite Civil Engineering 330. Fee \$1; deposit \$2. Mr. Grant.

Theory and practice of canal surveying, computation of earth work, field location of canals and ditches for irrigation. Lect. 1; field work 2.

363. Canal Management. Spring. 2 cr. Prerequisite Civil Engineering 362. Mr. Conkling.

Canal management, seepage, and drainage. Lect. 2.

364. Pumping for Irrigation. Spring. 2 cr. Prerequisites Civil Engineering 360, Mechanical Engineering 341. Mr. Conkling.

Small rotary and reciprocating pumps. Steam, gas, and oil engines used for pumping. Electric motor driven pumps. Lect. 2.

370. Municipal Engineering. Autumn. 4 cr. Prerequisite Civil Engineering 310. Mr. Ludwig.

City planning, allotting and platting additions; construction of streets; sidewalks, curbs, gutters, and parkings; disposal of refuse; city parks and their paths, walks and roadways; law affecting the work of the city engineer. Lect. 3; lab. 1.

371. Sanitary Engineering. Spring. 5 cr. Prerequisite Civil Engineering 333. Mr. Conkling.

Methods of sewage treatment and disposal. The design of a sewage system and a disposal plant; house drainage; specifications and estimate of cost. Lect. 2; lab. 3.

380. Contracts and Specifications. Spring. 2 cr. Mr. Conkling.

Correct form of specifications and judicial interpretation placed on technical terms commonly used in engineering specifications. Elective to all engineering students after the sophomore year. Lect. 2.

381. **Thesis.** Spring. 3 cr. Mr. Conkling.

The student will be required, before graduation, to present a suitable thesis upon some engineering subject in the line of his course. Subject must be chosen at the beginning of the senior year.

382. **Engineering Economics.** Spring. 3 cr. Prerequisite Junior standing. Mr. Grant.

The analysis of engineering projects from the business view point; the scope of engineering investigations; cost estimates; the mathematics of economic selection of machines; the relation of the engineer to the problems of finance and accounting. Lect. 3.

391-392-393. **Seminar.** Autumn, winter and spring. 3 cr. Mr. Conkling.

Junior and senior students are required to prepare and present papers upon assigned engineering topics at the weekly seminar period. Freshman and sophomore students are required to attend the weekly seminar without credit.

DAIRY

PROFESSOR, G. L. MARTIN.

200. **Farm Dairying.** Autumn. 3 cr. Fee \$2; deposit \$1.

History, distribution and development of the dairy industry, secretion, composition and analysis of milk and cream. Care of milk and cream on the farm, operation of separators, milking machines and coolers. Lect. 2; lab. 1.

201. **Community Dairying.** Winter. 3 cr. Fee \$2; deposit \$1.

The organization of cooperative dairy marketing associations, preparation and delivery of milk and cream to the local factory, processing milk and cream, making butter, cheese and ice cream, advertising sale of dairy products. Lect. 2; lab. 1.

300. **Inspection of Milk Products.** Autumn. 3 cr. Prerequisites Dairy 200, Chemistry 203. Fee \$2; deposit \$1.

Methods of inspection, scoring stables, dairies, milk depots, factories and markets; composition of milk products in relation to standards of purity. Lect 2; lab. 1.

301. Market Milk. Spring. 4 cr. Prerequisite Dairy 200.

Relation of the milk supply to producer, distributor and consumer. Grading and pasteurizing, standardizing, certifying, modifying, bottling and distribution of milk. Lect. 3; lab. 1.

302. Creamery Butter Making. Winter. 3 cr. Prerequisite Dairy 200.

Handling cream and making butter on a commercial scale, practice in pasteurizing, making starters; ripening cream, churning, packing and storing of butter. Lect. 2; lab. 1.

303. Cheese Making. Autumn. 4 cr.

Modern methods of making cheddar cheese adapted to farm and factory practice. Lect. 2; lab. 1.

304. Factory Management. Winter. 3 cr. Prerequisite Dairy 302, 303.

Organization, location, planning construction and equipping of factories, handling of by-products, preparation of exhibits, scoring, marketing and keeping dairy accounts. Lect. 2; lab. 1.

305. Dairy Technology. Spring. 3 cr.

Composition, manufacture and utilization of dairy products and by-products as applied in domestic and commercial arts. Lect 2; lab. 1.

ECONOMICS

PROFESSOR, J. M. HAMILTON.

300-301. Economics. Autumn and winter. 6 cr.

Principles of economic science. Study of such questions as trusts, labor and capital, money and banking, transportation and taxation. Lect. 3.

310. Sociology. Spring. 3 cr.

Introduction to sociology. Attention given to the problems of marriage and divorce, immigration, race questions, charities and corrections, pauperism and crime. Lect. 3.

320. Agricultural Economics. Winter. 3 cr. Prerequisite Economics 300.

Agricultural economic problems; land problems; agricultural labor; rural credit; cooperative association; markets. Lect. 3.

321. Rural Sociology. Spring. 3 cr.

Rural social problems; the farm home; rural health; country church; rural schools; roads; recreations; etc. Lect. 3.

322. Marketing. Autumn or spring. 3 cr.

Marketing functions, methods of sales, middlemen, storage, transportation, market exchanges, future trading, principles of cooperative marketing, stock and non-stock organizations, patronage dividends, cooperative marketing of grain, livestock, vegetables, and fruit. The autumn quarter is especially given for agricultural students. The spring quarter's work will include marketing of merchandise and manufactured products, and will be for secretarial students. Lect. 3.

330. Irrigation Institutions and Economics. Spring. 3 cr.

History and development of irrigation in western United States; riparian rights; doctrine of appropriation; legal duty of water; adjudication of water rights; Carey Land Act; National Reclamation Service; Montana irrigation laws. Lect. 3.

EDUCATION AND PSYCHOLOGY

PROFESSOR, J. H. HOLST.

100. College Education. Autumn. No cr.

A general course outlining the problems of college life with a discussion of fundamentals usually considered important by successful people. The course will be given under the direction of the president and the deans of women and men.

300. Psychology. Autumn. 3 cr. Prerequisite, junior standing or the consent of the instructor.

An intensive study will be made of the native equipment of the child and the psychology of learning.

301. Educational Psychology. Advanced Course. Winter. 3 cr. Prerequisite, Psychology 300 or its equivalent.

A systematic treatment of the psychological basis of educational theory. The methods, materials, and results of modern psychological investigations will be examined.

302. Mental and Vocational Tests and Treatment of Results. Spring. 3 cr. Prerequisite, Psychology 300, 301 or the equivalent.

The purpose of the course is to give acquaintance with the wide range of psychological, educational, and vocational tests and scales and the statistical treatment of results.

303. Development of Vocational Education. Spring. 3 cr.

A brief survey of industrial education prior to 1800, some of the most significant developments during the nineteenth century, and the present status and need, including a brief study of vocational guidance.

304. Principles and Methods of Teaching. Autumn. 3 cr.

The aims of education in a democracy; the application of educational principles; and the technique of classroom instruction.

305. Teaching Practice. Autumn, winter or spring. 4 cr. Prerequisites, junior standing or the consent of the supervisor.

Practice under supervision. Lesson plans, reports and conferences.

306. Itinerant Teachers' Training Work.

All students who meet the Smith-Hughes requirements and are teaching in the field may, through correspondence work, receive credit for courses in education. At present courses are being given to students through correspondence in psychology, educational psychology, and theory and practice of teaching.

307. Community Recreational Leadership. Summer. 3 cr.

A course for school teachers, principals and superintendents, dealing with all kinds of school and community organizations, programs and recreational activities.

308. School Law. Summer. 2 cr.

An outline of Montana school law. Emphasis upon the various legal relations of the teacher and the school officer.

400. School Organization and Management. Spring. 3 cr.

Open only to mature students who have had at least nine credits in education.

The organization and management of a town or rural school from the viewpoint of the principal. The curriculum; program of studies, records; finances; employment of teachers; and general administration.

401. Principles of Educational Philosophy. Winter. 3 cr.

This course is given mainly for teachers in Bozeman and the immediate vicinity.

Critical examination of the more fundamental approaches to the educational field, and attempts to harmonize some of the prevailing conflicts in the teaching field.

402. History of Education. Summer. 3 cr.

History of education, with especial emphasis on modern developments. The development of industrial and vocational education.

ELECTRICAL ENGINEERING

PROFESSOR, J. A. THALER. ASSOCIATE PROFESSOR, R. D. SLOAN.
INSTRUCTOR, J. M. FISKE.

101-102-103. Seminar. Autumn, winter and spring. Continuous. No cr. Mr. Thaler.

Weekly meetings for the purpose of discussing current electrical engineering literature. Lect. 1.

151-152-153. Radiotelegraphy. Autumn, winter and spring. Continuous. Credits variable. Mr. Thaler.

Theory and practice of radiotelegraphy, code instruction, practice in adjusting and operating field sets. Lect. 1; lab. 2.

201-202-203. Seminar. Autumn, winter and spring. Continuous. No cr. Mr. Thaler.

Weekly meetings for the purpose of discussing current electrical engineering literature. Lect. 1.

211. Electrical Machinery. Autumn. 3 cr. Mr. Sloan, Mr. Fiske.

Construction, care and operation of commercial electrical machines and apparatus, including batteries, electric lights, dynamos, motors, alternators, transformers, and electrical measuring instruments. Lect. 3.

231-232-233. Electrical Diagrams. Autumn, winter and spring. Continuous. 3 cr. Mr. Fiske.

Conventional methods of representing electrical wiring and appliances. National Electrical Code. Diagram of D. C. switchboards and electric light wiring. General and detail drawing of dynamos. Lab. 1.

301-302-303. **Seminar.** Autumn, winter and spring. Continuous. 3 cr. Mr. Thaler.

Weekly meetings for the purpose of discussing current electrical engineering literature. Lect. 1.

311-312-313. **Direct Currents.** Autumn, winter and spring. 10 cr. Prerequisites Physics 201, 202, 203, Mathematics, 201, 202, 203. Mr. Sloan, Mr. Fiske.

Principles of electromagnetism, theory of dynamo electric machines, design, construction and regulation of direct current machines. Lect. 3; 3, and 4.

321, 322, 323. **Electrical Laboratory.** Autumn, winter and spring. 4 cr. Prerequisite Physics, 207, 208, 209. Fee \$1; deposit \$5. Mr. Fiske.

Determination of armature and field resistance; magnetic leakage, efficiency and regulation of various types of direct current machines. Lab. 1; 1, and 2.

331-332-333. **Dynamo Design.** Autumn, winter and spring. Continuous. 6 cr. Prerequisite Electrical Engineering 231, 232, 233. Mr. Sloan, Mr. Fiske.

Designing electromagnets, dynamos and motors. Complete working drawings and specifications to accompany each design. Lab. 1; 2, and 3.

352. **Electrical Power.** Winter. 3 cr. Mr. Fiske.

Theory and construction of direct and alternating current generators, motors, transformers, and storage batteries; principles of power transmission and distribution. Lect. 3.

353. **Electrical Power.** Spring. 4 cr. Prerequisite Electrical Engineering 352. Fee \$1; deposit \$5. Mr. Fiske.

Industrial application of electricity. Electrical equipment of power stations and substations. Efficiency and regulation tests of batteries, transformers, direct and alternating current generators and motors. Lect. 3; lab. 1.

401-402-403. **Seminar.** Autumn, winter and spring. Continuous. 3 cr. Mr. Thaler.

Weekly meetings for the purpose of discussing current electrical engineering literature. Lect. 1.

411-412-413. **Alternating Currents.** Autumn, winter and spring. Continuous. 12 cr. Prerequisites Physics 301, 302. Mr. Thaler.

Theory of alternating currents, properties of alternating current circuits, principles of alternators, transformers, rotary converters and induction motors. Lect. 4.

421-422-423. **Electrical Laboratory.** Autumn, winter and spring. Continuous. 8 cr. Prerequisites Physics 301, 302. Fee \$1; deposit \$5. Mr. Sloan.

Tests of alternating current generators, motors and transformers, calibration of alternating current measuring instruments. Lab. 3; 3, and 2.

431-432-433. **Electrical Design.** Autumn, winter and spring. Continuous. 9 cr. Mr. Fiske, Mr. Sloan.

Drawing and design of alternating current apparatus, circuits, and power plants. Open to students taking Electrical Engineering, 411, 412, 413. Lab. 3.

450. **Special Design.** Credits variable. Mr. Sloan.

Design and construction of some special electrical apparatus or machine. Elective for seniors.

451. **Electrical Equipment of Buildings.** Autumn 4 cr. Mr. Sloan.

Electrical distribution and equipment for buildings; Underwriters' rules, communication and signal systems, light, lighting units, photometry and illumination.

452. **Electric Traction.** Winter. 3 cr. Mr. Sloan.

Electric railway and trunk line electrification economics, modern railway apparatus and railway power supply. Lect. 3.

453. **Hydroelectric Power.** Spring. 3 cr. Mr. Sloan.

Electrical equipment of hydroelectric power stations and the study of high tension transmission of electrical power. Lect. 3.

491-492-493. **Thesis.** Autumn, winter and spring. Continuous. 8 cr. Mr. Thaler.

Before graduating each student must present a suitable thesis upon some engineering subject in line with his course. The subject for the thesis must be chosen at the beginning of the senior year.

ENGINEERING DRAWING

ASSOCIATE PROFESSOR, RALPH T. CHALLENGER. ASSISTANT PROFESSOR, ALFRED LUDWIG.

101. **Mechanical Drawing.** Autumn. 3 cr. Mr. Challenger.

Use of instruments; lettering; principles of orthographic projection; arrangement of view; drawings of machine parts; dimensioning; titles, sections. Lab. 3.

102. **Mechanical Drawing.** Winter. 3 cr. Mr. Challenger.

Projections; intersections and developments; triangulation; pictorial representation. Lab. 3.

103. **Engineering Drawing.** Spring. 3 cr. Mr. Challenger.

Commercial drafting, practice in different branches of engineering; symbols and conventions; assembly views; detailing; patent drawing; tracing and blue printing. Lab. 3.

106. **Graphic Presentation of Statistics.** Spring. 3 cr. Mr. Ludwig.

Lettering; charts and diagrams, presentation of statistics by charts, graphs, and pictorial methods. Lab. 3.

ENGLISH

PROFESSOR, W. F. BREWER. ASSISTANT PROFESSOR, J. Q. OWEN, INSTRUCTORS, GERTRUDE SIBLEY, ANNA LINDBLOM, BEATRICE DAVIS.

101. **English Composition.** Autumn, winter. 3 cr. Mr. Brewer, Miss Lindblom, Miss Sibley, Mrs. Davis.

102. **English Composition.** Winter, spring. 3 cr. Mr. Brewer, Miss Lindblom, Miss Sibley, Mrs. Davis.

103. **English Composition.** Spring. 3 cr. Mr. Brewer, Miss Lindblom, Miss Sibley, Mrs. Davis.

Rhetorical principles. Written and oral composition with study of types of prose composition.

201. **Expository Composition.** Autumn, winter. 2 cr. Mr. Owen.

202. **Expository Composition.** Winter, spring. 2 cr. Mr. Owen.

203. Expository Composition. Spring. 2 cr. Mr. Owen.

English 201, 202, 203, required of all sophomores.

Instruction in the handling of units of expository composition from 300 to 600 words. As a basis for the written work, essays adapted to the vocational outlook of the students are assigned for reading each week and discussed orally in the classroom. The subjects of the essays are such as will relate the student's idea about his vocation to the various fields of knowledge with which he must come in contact either as student or vocational worker.

301. Advanced English Composition. Autumn. 2 cr. Mr. Brewer.

Elective for juniors and seniors.

302. Advanced English Composition. Winter. 2 cr. Mr. Brewer.

303. Advanced English Composition. Spring. 2 cr. Mr. Brewer.

Writing of technical papers especially adapted to the needs of technical students. Will apply in a special field the fundamentals of written and oral composition as given in English 101, 102, 103, and 201, 202, 203. In conducting the course the English department co-operates with the technical departments represented by the students who take the course.

304. Argumentation and Forms of Public Address. Autumn, winter and spring. Continuous. 6 cr. Mr. Owen.

Principles of argumentation; briefs and debates. Some study of the forms of public address with written and oral practice. Elective.

305-306-307. Modern Drama. Autumn, winter and spring. Continuous. 6 cr. Prerequisites English 101, 102, 103. Miss Lindblom.

A course in presentation and in reading of plays.

308-309-310. Nineteenth Century Literature. Autumn, winter and spring. Continuous. 9 cr. Miss Sibley.

Nineteenth century English literature; a study of nineteenth century prose and poetry. Reading of representative selections with particular reference to their political, social and economic setting. Lectures and classroom discussions.

With the consent of the instructor this course may be taken in any quarter separately.

311-312-313. **Contemporary Literature.** Autumn, winter and spring. Continuous. 9 cr. Miss Sibley.

A reading and discussion course in contemporary English and American novel, poetry, essay and short story.

With the consent of the instructor this course may be taken any quarter separately.

ENTOMOLOGY AND ZOOLOGY

PROFESSOR, R. A. COOLEY. ASSISTANT PROFESSORS, M. H. SPAULDING, W. S. REGAN. INSTRUCTOR, O. A. SIPPEL.

100. **General Zoology.** Autumn. 4 cr. Fee \$3. Mr. Spaulding.

Survey of invertebrate and vertebrate forms, including morphology, bionomics, development, classification, and economic or popular interest. Lect. 2; lab. 2.

101. **General Biology.** Spring. 6 cr. Fee \$3. Mr. Spaulding.

The fundamental principles of plant and animal life, planned particularly for the needs of students in home economics. Lect. 3; lab. 3.

200. **Invertebrate Zoology.** Autumn. 4 cr. Prerequisite Zoology 100. Fee \$3. Mr. Spaulding.

An advanced course, intended primarily for science students, presenting in more detail the structure, habits, taxonomy and importance of the invertebrate phyla, special stress being placed upon the arthropoda exclusive of the insects. Lect. 2; lab. 2.

201. **Human Physiology and Anatomy.** Winter. 6 cr. Prerequisite Zoology 100 or 101. Fee \$3. Mr. Spaulding.

Lectures and demonstrations presenting the main principles of animal physiology, the human body being used as the type, augmented by laboratory work in mammalian anatomy. Lect. 3; lab. 3.

202. **Economic Entomology.** Spring. 3 cr. Prerequisite Zoology 100 or 101. Fee \$2. Mr. Cooley.

Following a brief survey of the anatomy, metamorphosis and classification of insects, consideration is given to important insect pests and the principles and means of control. Lect. 2; lab. 1.

203. General and Systematic Entomology. Autumn. 4 cr. Prerequisite Entomology 202. Fee \$2. Mr. Cooley.

A continuation of Entomology 202, giving detailed consideration to classification into orders and families; study of types of the orders.

204. Superficial Anatomy. Autumn. 3 cr. Fee \$2. Mr. Spaulding.

Designed for art students, covering a study of the skeleton and skeletal muscles; dissection of a small mammal and comparison with a dissected manikin. Lab. 3.

300. Vertebrate Zoology. Spring. 6 cr. Prerequisite Zoology 100. Fee \$3. Mr. Spaulding.

Vertebrate (chordate) animals, treating in detail the structure and relationships of the different groups; their classification and economic importance. Elective to all students. Lect. 3; lab. 3.

301. Embryology. Winter. 5 cr. Prerequisite Zoology 100. Fee \$3. Mr. Spaulding.

Formation and growth of tissues and organs in the vertebrate body, based chiefly on the study of the chick, but including a consideration of the developments in the mammalia. Lect. 2; lab. 3.

302. Organic Evolution. Spring. 4 cr. Prerequisite Zoology 100. Mr. Spaulding.

The facts and theories of evolution and genetics; including variation, natural and artificial selection, heredity and inheritance, etc. Lect. 4.

303. Economic Zoology. Autumn. 3 cr. Prerequisite Zoology 100 or 300. Mr. Spaulding.

Discussion of vertebrates of economic importance, devoted chiefly to mammals and birds. Lect. 3.

304. Advanced Economic Entomology. Winter. 4 cr. Prerequisite Entomology 202. Fee \$2. Mr. Cooley.

Insect pests and insect control. Lect. 2; lab. 3.

305. Systematic Entomology. Winter. 4 cr. Fee \$2. Prerequisites Entomology 202, 203. Mr. Cooley.

A continuation of entomology 203, dealing with the fundamental principles and problems concerned in the classification of insects and a detailed study for practice of a selected group. Lect. 2; lab. 2.

400. **Advanced Entomology.** Autumn, winter and spring. Continuous. 6 to 10 cr. Prerequisites Entomology 202, 203, 304. Fee \$2. Mr. Cooley.

Individual instruction to fit the students' needs, including systematic, economic, biological and library work.

401. **Thesis.** Credits variable, not to exceed 5. Fee \$2 to \$10. Mr. Cooley or Mr. Spaulding.

Seniors in this department, and seniors from other courses who have had sufficient previous training, may elect this course.

FARM MANAGEMENT

PROFESSOR, E. L. CURRIER.

301. **Farm Management.** Spring. 3 cr. Mr. Currier.

Open to juniors and seniors in the college of agriculture. In this course are considered the problems that come up in the everyday administration of the farm business. Lect. 2; lab. 1.

302. **Farm Organization.** Spring. 3 cr. Mr. Currier.

Open to juniors and seniors in the college of agriculture. This course has to do with an analysis of the factors that have a bearing upon the efficient organization of farms. Such subjects are considered as "Size of Farm," "Labor Distribution," "Diversity," "Intensity," etc. Lect. 2; lab. 1.

303. **Farm Accounting.** Spring. 3 cr. Mr. Currier.

Open to juniors and seniors in the college of agriculture. Instruction in the keeping and interpretation of farm accounts. Lect. 1; lab. 2.

304. **Types of Farming.** Spring. 3 cr. Prerequisite, Farm Management, 302. Mr. Currier.

Field trips to study farms and types of farming. Farm analysis studies will be made on farms in the Gallatin valley, representing the common types of farming carried on here. A one hundred mile trip by rail will be taken to study farms typical of the plains region of eastern Montana.

FRENCH AND SPANISH

ASSISTANT PROFESSOR, J. CAMPBELL. INSTRUCTOR, C. JUMP.

100-101-102. **French.** Autumn, winter and spring. Continuous. 12 cr. Mrs. Jump.

Elements of grammar, with constant practice in pronunciation, dictation and conversation. Reading of easy texts.

120-121-122. **Spanish.** Autumn, winter, and spring. Continuous. 12 cr. Miss Campbell.

Elements of grammar, with conversation and special emphasis on pronunciation. Reading of simple texts.

200-201-202. **French.** Autumn, winter, and spring. Continuous. 12 cr. Miss Campbell.

Review of grammar. Typical fiction and dramas of the nineteenth century. Composition and original theme writing. Conversation and dictation.

220-221-222. **Spanish.** Autumn, winter, and spring. Continuous. 9 cr. Miss Campbell.

Reading of modern novelists and dramatists. Conversation and composition. Review of grammar.

300-301-302. **French.** Autumn, winter, and spring. Continuous. 9 cr. Mrs. Jump.

General survey of modern French literature. Study of typical masterpieces. Collateral reading and reports.

GEOLOGY

ASSISTANT PROFESSOR, E. J. QUINN.

300. **General Geology.** Winter or spring. 4 cr. Prerequisite Chemistry 101, 102, 103.

Application of the science of agriculture and engineering. Rocks and rock-forming minerals and their classification. A trip to Morrison cave, an interesting formation lying about fifty miles west of Bozeman, will be included in the field work. Lect. 4.

301. **Mineralogy.** Autumn or spring. 4 cr. Prerequisite Chemistry 101, 102, 103. Fee \$4; deposit \$4.

Crystallography and the classification and identification of the more important minerals and rocks. Lect. 2; lab. 2.

HISTORY

ASSOCIATE PROFESSOR, HELEN R. BREWER.

101-102-103. **European History.** Autumn, winter and spring. Continuous. 9 cr.

The development of modern Europe. Use of the library, with lectures on historical methods.

251-252-253. **Modern History.** Autumn, winter and spring. Continuous. 9 cr.

Current events, a review of the political and industrial development of the last few decades.

301-302-303. **Medieval History.** Autumn, winter and spring. Continuous. 9 cr. Alternates with History 451, 452, 453.

First two quarters a textbook is used; last two quarters on the Italian Renaissance, topical reference to the library and pictures.

375-376-377. **Industrial History.** Autumn, winter and spring. Continuous. Prerequisite History 101-102, 103.

Outlines of United States industrial history. Each quarter the student will write a paper on some special line of industry, which he either reads upon or personally investigates.

451-452-453. **American History.** Autumn, winter and spring. Continuous. 9 cr. Prerequisite History 101, 102, 103. (Given in 1922-23).

HOME ECONOMICS

PROFESSOR, GLADYS BRANEGAN. ASSISTANT PROFESSORS, EDITH FRANKS, JULIA TEAR, RUBY HOLMSTROM. INSTRUCTORS, M. MAXWELL, RUTH SWEAT.

100-101. **Foods.** Autumn and winter. 6 cr. Fee \$2.50. Miss Sweat.

Food principles, food composition and cookery processes. Students work in family-sized quantities in the laboratories, and the products are disposed of through sales and by use in the dormitory. Students are divided into sections according to the extent of their previous training in food work. Those with no preparatory work are given more intensive training. Lect. 1; lab. 2.

102. **Foods.** Spring. 3 cr. Food preparation and serving taught on the meal basis. Open to any student in the college whose major work is not in home economics.

103-104-105. **Clothing.** Autumn, winter and spring. 9 cr. Fee \$2. Miss Holmstrom, Miss Tear.

Hand and machine sewing applied to useful articles and garments. Drafting simple patterns, use and alteration of drafted and commercial patterns. Where necessary to strengthen the technique in sewing, summer projects will be assigned between freshmen and sophomore years.

106. **Clothing.** 3 cr. Autumn. Fee \$1.50. Miss Holmstrom.

A course arranged to meet the needs of college students whose major work is not in home economics. It includes the adaption of patterns, and selection and making of garments. Lect. 1; lab. 2.

107-108. **Textiles.** Winter and spring. 4 cr. Fee \$2. Miss Tear.

The history, production, identification and testing of textiles, developing judgment in selection of fabrics for the house and for clothing. Lect. 1; lab. 1.

109-110. **Home Living.** Autumn and winter. Required of all home economics freshmen. 2 cr. Given by members of the faculty.

Care of person, clothing, room, banking, group-living and study methods. Lect. 2.

200. **Food Preservation.** Autumn. 3 cr. Prerequisites Chemistry 101, 102, 103, Home Economics 100, 101, Parallel with Bacteriology 201. Fee \$2.50. Miss Sweat.

Home and commercial methods of food preservation, including canning, drying, pickling, preserving, smoking, refrigeration and cold storage. Lect. 1; lab. 2.

201. **Food Studies.** Spring. 4 cr. Prerequisites Home Economics 200, Chemistry 207, Zoology 201. Fee \$2.50. Miss Sweat.

Comparative study of the science underlying the selection and preparation of foods. Special problems are assigned for individual investigation. Practice is given in organizing and presenting subject matter to the public, each student giving at least one demonstration. Lect. 2; lab. 2.

202. **Millinery.** Spring. 3 cr. Fee \$2. Miss Tear.

Renovation and remodeling summer materials and hats, problems in construction, covering and trimming. Students are urged to bring from home old hats and trimmings for use in this course. Lect. 1; lab. 2.

300. **Food Economics.** Spring. 4 cr. Open to juniors. Fee \$4. Miss Sweat.

Planning family meals relative to nutrition and cost. Practice is given in marketing and in preparing and serving various types of meals. Some work is given in fancy cookery. Lect. 2; lab. 2.

301. **Home Nursing.** Winter. 2 cr. Required of juniors in home economics teacher's training course. Mrs. McCray.

Caring for the sick in the home. Lect. 1; lab. 1.

302. **Designing and Draping.** Autumn. 5 cr. Prerequisite Home Economics 105. Fee \$1. Miss Tear.

Study is made of the effect of color and line on dress; of historic costume and its influence on modern dress. This course aims to develop originality in designing through the medium of substitute materials draped on the dress models. Lect. 2; lab. 3.

303. **Advanced Dressmaking.** Spring. 4 cr. Prerequisite Home Economics 302. Miss Holmstrom.

Problems of construction of silk and wool garments. Lect. 1; lab. 2.

304. **Millinery.** Autumn. 3 cr. Prerequisite Home Economics 202. Fee \$2. Miss Tear.

Construction of hat frames of various types, plain covering, trimming, renovation and use of old materials. Lect. 1; lab. 2.

305. **Child Care and Training.** 2 cr. Autumn. Miss Franks.

Mental and physical development of the child, and of those influences which promote normal growth and health. Lect. 2.

306. **Survey of Institutional Organization.** Autumn. 3 cr. Open to juniors and seniors. Miss Maxwell.

The different types of institutional work, the training, qualifications and experience of institutional workers; and the general principles of management, including service problems.

307. Institutional Cookery. Winter. 4 cr. Open to juniors and seniors. Miss Maxwell.

Cookery principles and their application to large quantity work in dormitory kitchen and laboratories.

308. Institutional Buying. Winter 2 cr. Open to juniors and seniors. Miss Maxwell.

Marketing of food supplies and their storage. Buying of equipment for food departments and dormitories. Also laundry and linen problems.

309. House Furnishing. 5 cr. Winter. Fee \$1. Miss Branegan.

The furnishing of homes of various economic standards, in reference to convenience, sanitation and artistic value. A comprehensive study of the history of furniture is made. Detail furnishing plan and interior drawings made for the house planned in the house planning course.

310. Extension Course. Winter. 3 cr. Miss Turley, Miss Branegan.

A history of the development of extension work, also special methods and outlines for field work. The students will do some field work under supervision of the extension staff. Lect. 2; lab. 1.

311. Needlecraft and Weaving. Spring. 4 cr. Fee \$1. Miss Holmstrom.

Decorative designs applied to clothing and household textiles. Pattern weaving on various types of loom is included.

312. Children's Clothing. Winter. 4 cr. Prerequisite Home Economics 105. Fee \$1.50. Miss Holmstrom.

Designing and drafting patterns for children's garments. Infant's layette is also included.

313. Advanced Textiles. Winter. 3 cr. Fee \$2. Miss Tear.

Household furnishings and clothing from the economic standpoint; laundrying, social phases of the textile industry. Lect. 2; lab. 1.

400. Dietetics. Autumn. 6 cr. Prerequisites Home Economics 300, Chemistry 310, Bacteriology 201. Fee \$4. Miss Branegan.

Human nutrition and metabolism, the relation of food to health and disease, the construction and preparation of dietaries. The members of the class assist in conducting nutrition classes with children. Lect. 3; lab. 3.

401. Household Administration. Winter or spring. 6 cr. Open to seniors. Fee \$.50. Miss Branegan.

Family incomes, budgets, household accounts, labor-saving devices and housekeeping. During the course groups of students spend a stated time doing work in the home management house. Lect. 2; lab. 4.

402. Thesis. Autumn or winter or spring. 3 cr. Open to seniors. Fee \$.50 to \$6. Various members of department faculty.

Independent studies and investigations in any phase of home economics. Conference 1.

403. Experimental Cookery. Winter. 3 cr. Open to seniors. Fee \$2. Miss Branegan.

Qualitative experimental work in cookery. Lect. 1; lab. 2.

404. Dietetics. Winter 3 cr. Prerequisite Home Economics 400. Fee \$2. Miss Branegan.

Special attention is given to the study of recent advances in the science of nutrition, and to training for specialized work in the field of nutrition. Lect. 2; lab. 1.

405. Institutional Experience. Spring. 4 to 7 cr. Prerequisites Home Economics 306, 307, 308. Miss Maxwell.

Open to seniors. Limited Section. Actual experience in Hamilton Hall and cooperating hospitals in various kinds of service other than cookery. Each student will carry the responsibility of the management for a given time.

406. Seminar. Spring. 3 cr. Prerequisites Home Economics 400, Chemistry 310, Bacteriology 201, Physics 204. Miss Branegan and departmental faculty.

Students will read and abstract articles from current magazines and books. Two papers will be required.

HOME ECONOMICS EDUCATION

ASSISTANT PROFESSORS, JULIA TEAR, EDITH FRANKS.

314-315. Special Methods in Home Economics. Winter and Spring. 6 cr. Miss Tear, Miss Franks.

Theory and practice of teaching home economics in public schools. Study is made of courses in various types of institutions. Courses of study are planned for graded schools, high schools, and colleges. Lesson plans are given special attention. Lect. 3.

407. **Teaching Practice in Home Economics.** Autumn or winter or spring. 3 cr. Miss Franks.

Preparation of lesson plans and outlines, with an opportunity to observe and teach classes in the Bozeman public schools and the Gallatin County High School.

HORTICULTURE

PROFESSOR, F. M. HARRINGTON, ASSISTANT PROFESSOR, C. C. STARRING

100. **Principles of Plant Production.** Winter. 3 cr. Prerequisite Botany 100. Fee \$1; deposit \$1. Mr. Harrington.

Propagation of plants by budding, cutting, division, grafting, layering, separation, seeds and spores; methods of gathering and storing seeds. Lect. 2; lab. 1.

300. **Systematic Pomology.** Autumn. 5 cr. Prerequisites Horticulture 100, Botany 100. Fee \$5. Mr. Starring.

Description and naming of varieties of fruit. Judging of exhibition fruit and discussion of score cards. Evolution of cultivated plants, especially fruits. Lect. 2; lab. 3.

301. **Greenhouse Construction and Management.** Winter. 4 cr. Prerequisite Horticulture 100. Mr. Harrington.

Construction, heating and maintaining of greenhouses; growing plants in greenhouses and conservatories. Lect. 4.

302. **Landscape Gardening.** Autumn. 4 cr. Fee \$1. Mr. Starring.

Laying out and planning of private and public grounds are discussed. Trees, shrubs, and flowers suited to Montana conditions are studied. Lect. 2; lab. 2.

303. **Thesis.** 6 cr. Mr. Harrington.

Horticultural students may elect to prepare during the senior year a thesis, the subject of which must be approved by the head of the department of horticulture.

304. **Commercial Vegetable Growing.** Winter. 5 cr. Prerequisite Horticulture 101. Mr. Starring.

Organization and management of market and truck gardens; special problems connected with growing vegetables on a large scale. Preparation of vegetables for market; methods of marketing, storage of vegetables. Lect. 4; lab. 1.

101. Vegetable Gardening. Spring. 3 cr. Prerequisites Botany 100, Horticulture 100. Fee \$1. Mr. Starring.

Principles of gardening, with special reference to their bearing upon the farm home garden. Potato growing will receive special consideration. Lect. 2; lab. 1.

305. Fruit Growing. Winter. 3 cr. Prerequisites Botany 100, Horticulture 100. Fee \$1; deposit \$1. Mr. Harrington.

Principles of growing tree fruits, with special reference to their bearing upon the farm home orchard. Lect. 2; lab. 1.

306. Trees, Shrubs and Flowers on the Farm. Autumn. 2 cr. Prerequisites Botany 100, Horticulture 100. Fee \$1. Mr. Starring.

Trees, shrubs and flowers adapted to Montana. Principles of planning farmsteads to get desirable ornamental effects. Planting, pruning and other cultural practices with trees, shrubs and flowers. Elective for agricultural students. Lect. 1; lab. 1.

307. Small Fruit Culture. Spring. 2 cr. Prerequisites Botany 100, Horticulture 100. Fee \$1. Mr. Starring.

The principles of growing currants, gooseberries, strawberries, raspberries, blackberries and other brambles and grapes. Lect. 1; lab. 1.

308. Horticultural Practices. Autumn. 3 cr. Prerequisites Horticulture 101, 305. Fee \$1.

A general course especially suited to men looking ahead to Smith-Hughes work. Includes variety studies of fruits, potatoes, etc. suited to Montana, preparation for exhibit purposes and judging of same. Also cultural practices, harvesting, grading, storing, and marketing. Given in autumn of 1922. Alternate years thereafter. Lect. 2; lab. 1.

309. Commercial Fruit Growing. Spring. 4 cr. Prerequisite Horticulture 305.

Planting, cultivating, irrigating and managing commercial orchards. All operations involved in the successful growing of fruit. Given in spring of 1923. Alternate years thereafter. Lect. 3; lab. 1.

310. Commercial Handling of Fruit. Autumn. 3 cr. Prerequisite Horticulture 305.

Methods of harvesting, grading, packing, storage, and marketing of fruits. Also fruit by-products. Given in fall of 1922. Alternate years thereafter. Lect. 3.

311. Orchard Work. Autumn. Prerequisite Horticulture 310 or registration in that course along with 311.

One week's work during the fall in some commercial fruit region such as the Bitter Root valley, under direction of an instructor. Open only to students whose major work is in horticulture. Given in autumn of 1922. Alternate years thereafter.

312. Seminar. Spring. 1 cr.

General horticulture seminar—including work along any horticultural lines, and serving as a clearing house for all matters pertaining to horticultural work.

MATHEMATICS

PROFESSOR, W. D. TALLMAN. ASSISTANT PROFESSOR, A. A. MCSWEENY. INSTRUCTORS, F. M. BULL, B. H. LOWE.

101. Engineering Mathematics. Autumn or winter. 5 cr. Mr. McSweeney, Mr. Lowe, Miss Bull.

The first three-fifths of the quarter's work is given to plane trigonometry. The remainder of the quarter is devoted to college algebra. The work of this quarter and about half of the following quarter covers a review of radicals and quadratic equations, progressions, binominal theorem, theory of limits, undetermined coefficients, infinite series, permutations and combinations, probability, and an introduction to the theory of equations.

102. Engineering Mathematics. Winter or spring. 5 cr. Mr. McSweeney, Miss Bull, Mr. Lowe.

Half of the quarter is devoted to the continuation of the algebra started in the first quarter, and the remainder of the time is devoted to analytical geometry.

103. Engineering Mathematics. Autumn or spring. 5 cr. Mr. McSweeney, Mr. Lowe, Miss Bull.

Continuation of analytical geometry, and work in calculus covering "Woods & Bailey" course in mathematics, Vol. I, with the exception of the last three chapters.

104-105-106. Elementary Analysis. Autumn, winter and spring. 12 cr. Miss Bull.

Mathematics covering the fundamental principles of college algebra, trigonometry, analytical geometry and calculus, designed to meet the needs of scientific students who cannot find the time to take the more extended course in these subjects found in Engineering Mathematics, 102 to 203.

109. **Introductory Mathematics for Agricultural Students.** Spring. 4 cr. Miss Bull.

201. **Engineering Mathematics.** Autumn or winter. 4 cr. Mr. Tallman.

"Woods & Bailey," Vol. I, is completed and the subjects of integral calculus, solid analytical geometry, elements of differential equations are given substantially as in Vol. II in this course and in courses 202 and 203.

202. **Engineering Mathematics.** Winter or spring. 4 cr. Mr. Tallman.

Continuation of course 201.

203. **Engineering Mathematics.** Spring or autumn. 4 cr. Mr. Tallman.

Continuation of course 202.

206. **Mathematical Theory of Investments.** Spring. 3 cr. Prerequisites Mathematics 101, 102, 103, 104, 105, 106. Mr. Tallman.

301-302-303. **Differential Equations.** Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Ordinary and partial differential equations with geometrical and mechanical applications.

307-308-309. **Statistics.** Autumn, winter and spring. Continuous. 9 cr. Prerequisite Mathematics 201 to 206, inclusive. Mr. Tallman.

Theory of probability, general methods of statistical investigation, application of the theory of probability to statistical data, fitting curves to observations, interpolation, theory of errors, mathematical theory of variation and correlation, and application of the principles developed in selected problems.

311-312. **Descriptive Astronomy.** Autumn and winter. 4 cr. Prerequisite Mathematics 101, 102, 103, 104, 105, 106. Mr. McSweeney.

A critical study of the astronomy of today, together with a practical application to engineering. A knowledge of principal stars and constellations will be required for the completion of this course.

313. **Theory of Least Squares and Probable Error.** Spring. 3 cr. Prerequisites Mathematics 201, 202, 203. Mr. Tallman.

401-402-403. **Partial Differential Equations of Mathematics-Physics.** Autumn, winter and spring. Continuous. 9 cr. Mr. Tallman.

Course based on Weber's "Die Partielle Differential Gleichungen der Mathematischen Physik," and Byerly's "Spherical Harmonics."

406. **Celestial Mechanics.** Spring. 4 cr. Alternate years. Prerequisites Physics 201, 202, 203, Mathematics 201, 202, 203. Mr. McSweeney.

An application of the principles of mechanics to the problems of the universe, including the problem of two bodies.

Courses 101, 102, 103, 201, 203, 204, will be repeated in other quarters than those scheduled if demanded by six or more students. During the fourth quarter such of the above courses will be offered only when sufficient numbers of students demand them. Should there be a demand during the fourth quarter, a twelve credits course covering 102 and 103 or one covering 201 and 202 may be offered.

MECHANICAL ENGINEERING

PROFESSOR, EARLE B. NORRIS (Dean); ASSOCIATE PROFESSORS, RALPH T. CHALLENGER, ERIC THERKELSON. ASSISTANT PROFESSOR, F. C. HOMANN. INSTRUCTOR, F. W. KATELY.

101. **Forging.** Autumn or winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Care of the fire; practice in forging, including drawing, bending, upsetting, and pointing of iron and steel; welding of mild steel and iron; working of tool steel. Lab. 2.

102. **Foundry Work.** Autumn or winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Kately.

Floor and bench moulding; core making; cupola charging; pouring castings of gray iron, brass, and other alloys. Lab. 2.

103. **Pattern Work.** Autumn, or winter or spring. 2 cr. Prerequisite Mechanical Engineering 102. Fee \$2; deposit 2. Mr. Kately.

Allowance for draft, shrinkage and finish; construction of patterns of machine parts, with necessary core boxes. Lab. 2.

111-112-113. **Seminar.** Autumn, winter and spring. No cr. Mr. Norris.

All mechanical engineering students are required to attend the weekly seminar conducted by the students in this department. These meetings serve to give the underclass students a conception of the field of engineering activity included in the profession of mechanical engineering. Lect. 1.

201. **Machine Work.** Autumn or winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Homann.

Machine work on lathe, drill press, planer and shaper. Lab. 2.

202. **Mechanical Practice.** Winter or spring. 2 cr. Fee \$2; deposit \$2. Mr. Homann.

Belt lacing; knots, lashing, splicing; steam fitting; babbitting bearings; machine assembling and erecting; aligning shafting. Lab. 2.

203. **Advanced Foundry Work.** Autumn, or winter or spring. 2 cr. Prerequisite Mechanical Engineering 102. Fee \$2; deposit \$2. Mr. Kately.

Advanced moulding and core work; cupola management; foundry equipment and arrangement. In this course the student is expected to take charge of the cupola in running a heat. Lab. 2.

211-212-213. **Seminar.** Autumn, winter and spring. No cr. Mr. Norris.

See announcement of courses 111, 112, 113.

221-222-223. **Kinematic Drawing.** Autumn, winter, and spring. 3 cr. Taken with Mechanical Engineering 224. Mr. Challenger.

Drafting room problems in the laying out of different types of mechanism to perform given functions. Lab. 1.

224. **Mechanism.** Autumn. 3 cr. Prerequisites Engineering Drawing 101, Mathematics 101, 102, 103. Mr. Challenger.

Relative motions of machine parts; linkwork; belting; cams; systems of gear teeth; spur, bevel, helical and worm gears; gear trains; planetary gearing. Lect. 3.

301-302. **Machine Tool Work.** Autumn and winter 4 cr. Prerequisite Mechanical Engineering 201. Fee \$2; deposit \$2. Mr. Homann.

Advanced work on lathe, planer, shaper, milling machine, and grinder; manufacture of small tools, fitting of parts. Lab. 2.

303. **Heat Treatment of Steels.** Spring. 2 cr. Fee \$2; deposit \$2. Mr. Homann.

Hardening, tempering and annealing; case-hardening; heat treatment of alloy steels; testing physical properties and structures; gas, electric and thermit welding. Lab. 2.

311-312-313. **Seminar.** Autumn, winter and spring. 3 cr. Mr. Norris.

A weekly seminar is conducted by the students in the mechanical engineering department. Junior and senior students prepare and present papers upon assigned topics relating to current practice in mechanical engineering lines. Lect. 1.

321. **Valve Gears.** Autumn. 2 cr. Prerequisite Mechanical Engineering 224. Taken with Mechanical Engineering 331. Mr. Challender.

The simple slide valve; valve diagrams; valve setting; reversing motions; riding cut-off; corliss and poppet valve mechanisms. Lect. 1; lab 1.

322-323. **Machine Elements.** Winter and spring. 6 cr. Prerequisites Mechanical Engineering 224, Civil Engineering 320. Mr. Challender.

The application of the laws of mechanics and strength of materials to the design of machine elements and fastenings, systems of power transmission, journals, and simple machines. Lect. 1; lab. 2.

331. **Steam Engines and Boilers.** Autumn. 4 cr. Mr. Therkelsen.

Types of boilers; boiler construction; properties of steam; boiler rating; boiler settings; combustion of fuels; feed waters; boiler accessories; types of steam engines; multi-expansion engines; condensing; corliss, poppet-valve and uni-flow engines; steam turbines. Lect. 4

332-333. **Thermodynamics.** Winter and spring. 8 cr. Prerequisites Mechanical Engineering 331, Physics 201, 202, 203. Mr. Therkelsen.

Properties of gases, saturated and superheated vapors and mixtures; theoretical and actual engine cycles; flow of liquids through nozzles; throttling processes; application to study of actual engine economics. Lect. 4.

335. **Heat Engines.** Winter. 3 cr. Prerequisites **Mathematics** 201, 202, 203, **Physics** 201, 202, 203, 207, 208, 209. Mr. Therkelsen.

Steam boiler types; boiler construction; combustion of fuels; furnace efficiency; types of steam engines; engine economics; internal combustion engines. Lect. 3.

341. **Mechanical Laboratory.** Autumn. 2 cr. Taken with **Mechanical Engineering** 331. Fee \$2. Mr. Therkelsen.

Calibration of instruments; calorimetry; indicator practice; fuel and lubricant tests; determination of power and mechanical efficiency of engines. Lab. 2.

342-343. **Mechanical Laboratory.** Winter and spring. 4 cr. Prerequisite **Mechanical Engineering** 341. Fee \$2. Mr. Therkelsen.

Exercises in valve setting; tests of injectors, pumps and engines; thermal and mechanical efficiency tests of gasoline and oil engines. Lab. 2.

345. **Mechanical Laboratory.** Winter. 2 cr. Taken with **Mechanical Engineering** 335. Fee \$2. Mr. Therkelsen.

Calibration of instruments; indicator practice; determination of power and mechanical efficiency of engines. Lab. 2.

411-412-413. **Seminar.** Autumn, winter and spring. 3 cr. Mr. Norris.

See announcement of courses 311, 312, 313.

414. **Manufacturing Methods and Machinery.** Autumn. 3 cr. Mr. Norris.

The basic materials of engineering; production of steels; non-ferrous alloys; founding; forging methods and machinery; hot and cold press work; extrusion; machining; machine tools; prevention of corrosion. Lect. 3.

416. **Industrial Organization and Management.** Spring. 3 cr. Mr. Norris.

Economics of factory location; staff and departmental organization; production planning and control; inspection systems; cost systems; modern wage systems; employment and labor problems; profit-sharing plans; cooperative management systems. Lect. 3.

421-422-423. **Machine Design.** Autumn, winter and spring. 9 cr. Prerequisites Mechanical Engineering 322, 323. Mr. Challender.

The application of principles of preceding courses to the design of complete machines. Assigned problems on machine tools, pumps, steam engines, gas engines and steam turbines. Lect. 1; lab. 2.

431. **Gas Power.** Autumn or winter. 4 cr. Prerequisite Mechanical Engineering 331 or 335. Mr. Therkelsen.

Gas engine cycles; fuel mixtures; details of construction; performance of gas motors; design practice in stationary and automobile motors; gas producers and other gas machinery. Lect. 3; lab. 1.

434. **Engineering of Power Plants.** Autumn. 3 cr. Prerequisite Mechanical Engineering 335. Mr. Therkelsen.

A modification of course 435 with special emphasis on equipment for electric power plants. Lect. 2; lab. 1.

435. **Mechanical Engineering of Power Plants.** Winter. 4 cr. Prerequisite Mechanical Engineering 431 or 435. Mr. Therkeisen.

Modern mechanical equipment of steam and gas power plants; costs and economics; selection of types and sizes; arrangements of plants; piping systems; fuel and ash handling; principles underlying design of complete plants; specifications. Lect. 3; lab. 1.

436. **Heating and Ventilation.** Spring. 2 cr. Prerequisite Mechanical Engineering 431 or 435. Mr. Therkelsen.

Calculation of heat losses from buildings. Radiation requirements for steam, vapor and hot water systems. Furnace systems. Ventilation with calculations for specific systems. Specifications and estimates of costs. Lect. 2.

441. **Mechanical Laboratory.** Autumn. 2 cr. Prerequisites Mechanical Engineering 332, 333, 341. Fee \$2. Mr. Therkelsen.

Efficiency tests of steam and gas power plant machinery; refrigeration, compressed air and heating and ventilating equipment. Lab. 2.

444-445-446. **Thesis.** Autumn, winter and spring. 6 cr. Mr. Challender or Mr. Therkelsen.

Before graduation, the student is required to present an accepted thesis involving an investigation of some problem related to mechanical engineering. Work will be done under the supervision of a member of the faculty, but the student will devise his own methods.

MILITARY SCIENCE AND TACTICS

PROFESSOR, V. A. CALWDELL, COL. INF. RETD. INSTRUCTOR, L. A. ELLSWORTH, SERGEANT, D. E. M. L.

100-101-102. Military Science. 3 cr.

Infantry drill regulations; field and combat exercises; tactics-use of relief map, sand table, and large scale maps; auxiliary infantry weapons; schools of the soldier and squad; marksmanship training; bayonet combat; team work; outpost instruction; interior guard; field engineering. Required of all freshman men two hours each week.

200-201-202 Military Science. 3 cr.

Infantry drill regulations; field training and combat exercises; tactics-use of relief map, sand table, and large scale topographical maps; auxiliary infantry weapons; school of the soldier and squad; marksmanship training; bayonet combat; team work; outpost instruction; interior guard; field engineering. Required of all sophomore men two hours each week.

300-301-302. Military Science. 6 cr.

Instruction and supervision of military science 100, 101, 102, 200, 201, 202. Infantry drill regulations; lectures on the nature, character, purpose, and function of (1) the object of all military training, (2) the code of tactical principles, (3) tactical methods. Elective to juniors, five hours each week.

400-401-402. Military Science. 6 cr.

Continuation of courses 300, 301, 302. Elective to seniors five hours each week.

MUSIC

PROFESSOR, WILLIAM HOWARD. INSTRUCTORS, MARTHA HADLEY, EDITH BYRAM, L. HOWARD.

The department of music offers to students of the college and others opportunity to pursue the study of the main branches of music under competent instructors.

Tuition is payable to the secretary of the college in advance. No reduction will be made for absence from lessons. Teachers will make up hours they fail to give according to schedule.

The department is closed on the college holidays. Lessons falling on these days will not be made up.

No student is permitted to take part in any public performance without the consent of the director.

Students of this department will be granted certificates, if desired, testifying to quality and amount of work done.

Recitals are given from time to time, by the instructors and advanced students, to which admission is free.

Music to a total of not more than six credits may be counted toward a degree in those courses which allow free electives. To those regular students who elect music the college will furnish free one thirty-minute lesson a week during any two years of the sophomore, junior or senior years, or any quarter of these three years; and the work may be elected in either vocal or instrumental music.

Students who enroll in two musical organizations may be given one-half credit per quarter in each, but in no case may a student exceed one credit per quarter for all musical organizations in which he is enrolled.

PIANO

The instruction in piano will comply with the special needs of each individual student, and the courses of music given for study will be taken from the works of such standard composers as are recognized by the leading musicians and musical institutions of the world. Specimen programs illustrating the class of music taught will be sent to anyone interested by the department. Elementary harmony is given with the piano lessons as an aid to the analysis of each piece which is so necessary in memorizing.

Ensemble and Sight Reading

In this branch of instruction lie indispensable elements of musical knowledge and culture. Ensemble playing develops the students' ability in sight reading, and enables them to acquire an acquaintance with the masterwork of symphonic and orchestral literature, which is ordinarily inaccessible to the music student.

Theory

Courses in harmony and musical history and analysis will be given.

VOICE

The training and development of the voice proceeds hand in hand with the acquisition of musical tastes and intelligence. Methods are adapted to individual needs. The voice is trained for correct placement, artistic tone, flexibility and agility. The possibilities of varied tone qualities for expressional purposes are emphasized and illustrated. The study of vocal technique includes the subjects of breathing, resonance, tone color, correct attack, sustained tones, scales, arpeggios, legato, staccato, embellishments. Various exercises are used. Attention is given to elegance of diction.

The cultivation of musical taste and artistic interpretation is effected by study of the best modern and classic art songs, operatic arias, and oratorio selections. The art of singing is a complex one, as so much depends on the intellectual and emotional status of the singer. Hence the singer should aim to acquire general culture, appreciation of the beautiful in the world of thought and emotion as well as in the realm of sound.

VIOLIN

The violin will be taught by the director personally. Great care will be given to the sound, fundamental principles of violin technic. General position, action of fingers, shifting, especially bowing. Poor bowing is the cause of the failure of many violinists. In fact, one must be well grounded in all the branches of technic to succeed. The course will cover everything from the "beginner" to what is commonly called the "Standard Conservatory Graduation" grade.

MUSIC TUITION

Piano, Violin, and Voice

One half-hour lesson per week for one quarter	\$18.00
Two half-hour lessons per week for one quarter	33.00
Ensemble playing per quarter	7.00
Harmony and Theory per quarter	10.00

When students enter late, lessons missed will be deducted at the rate of \$1.00 per lesson.

Piano practice on the college pianos may be arranged for at the following rates:

One hour daily per quarter	\$ 4.00
Additional hour per quarter	3.00

PHYSICAL EDUCATION FOR MEN

PROFESSOR, D. V. GRAVES. INSTRUCTOR, E. S. WILSON.

At the beginning of the college year, each new student is given a thorough physical examination by the college physician and his staff. The condition and health of the student as shown by this examination are used in outlining the exercises and developmental work given.

All candidates for the various athletic teams must have written permission of the college physician before reporting for practice.

Physical education is required of all first and second year students throughout the college year, and six credits must be secured to enable the student to graduate.

The regulation suit consists of **white sleeveless shirt, running-pants, supporter, and rubber-soled shoes.** For outdoor games, heavy shoes, khaki trousers, and full-sleeved shirt or jersey will be needed. The student activity fee provides funds for the purchase of athletic equipment used in intercollegiate contests and in so far as possible for intramural games.

All requests for exemption or postponement must be made at the office of the professor of physical education, and to become effective they must be approved by him and by the dean of the student's department. They will be granted only in the following cases:

1. Students physically unfit to take part.
2. Students doing outside work of such nature as to provide sufficient and varied exercise and who, on account of this work, are unable to meet classes.
3. Students providing satisfactory evidence of previous completion of this work.
4. Other cases deemed advisable by professor of physical education and approved by the dean of the department.

101-102-103. **Physical Education.** Autumn, winter and spring. Continuous. 3 cr.

Developmental work varied and increased from time to time, including setting-up exercises, mat work, tumbling, and elementary work on gymnastic apparatus. In connection with these exercises talks and demonstrations on personal hygiene and first-aid are given as needed. Swimming instructions, mass games and mass athletics are also given, and the course is varied as far as possible in order to make it interesting and helpful.

201-202-203. **Physical Education.** Autumn, winter and spring. 3 cr. Prerequisites Physical Education 101, 102, 103.

Fashioned after course 101, 102, 103 except that the work is more specialized and increased as the student becomes proficient in fundamentals.

PHYSICAL EDUCATION FOR WOMEN

DIRECTOR, UNA B. HERRICK (Dean). INSTRUCTOR, LORA MAXWELL.

101-102-103. **Physical Education.** Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

Physical examination on entering. The chief aim throughout the year is to establish good posture and carriage and to strengthen vital functions. The work will consist of Swedish body-building work, floor tactics, fundamental light apparatus work, rhythmic dancing and games, simple first aid. The regulation gymnasium suits and shoes will be required. Lect. 2.

201-202-203. **Physical Education.** Autumn, winter and spring. Continuous. 3 cr. Miss Maxwell.

Lectures, recreational games, advanced light apparatus work, corrective gymnastic, folk and aesthetic dancing. First aid. Lect. 2.

301-302-303. **Playground.** Autumn, winter and spring. Continuous. 6 cr. Miss Maxwell.

Preparation in theory, methods and practice teaching in physical education. Games, playground work, corrective exercises and folk dancing. Practical experience is gained by the teaching of classes in all grades of the city public schools and high schools.

PHYSICS

PROFESSOR, F. W. HAM. ASSISTANT PROFESSOR J. A. KIEFER.

201-202-203. **Engineering Physics.** Autumn, winter and spring. Continuous. 9 cr. Mr. Kiefer.

More mathematical than physics 221 and particularly designed to meet the needs of students in engineering. Students who have not completed mathematics 201, 202, 203 are required to take it during the same year that physics 201, 202 and 203 are taken. Lect. 3.

204. Household Physics. Winter. 5 cr. Fee \$1; deposit \$1. Mr. Ham.

Physics of ventilation, the lighting and heating of houses, and other physical phenomena of interest to the housekeeper. Lect. 3; lab. 2.

207-208-209. Physical Measurements. Autumn, winter and spring. Continuous. 6 cr. Fee \$1; deposit \$1. Mr. Kiefer.

Laboratory course designed to supplement physics 201, 202, and 203. Lab. 2.

214-215. General Physics. Winter and spring. 10 cr. Prerequisites Mathematics 104, 105, 106. Fee \$1; deposit \$1. Mr. Ham.

For students desiring a general knowledge of physics either in connection with the other sciences or as a matter of general education. The course will consist of a general survey of mechanics, heat, light, electricity and magnetism, and sound, and will be less mathematical than the technical courses in physics.

Lecture demonstrations will be numerous, and the student will be given an opportunity to test many of the laws for himself in the laboratory. Lect. 3; lab. 2.

221. Agricultural Physics. Spring. 5 cr. Fee \$1; deposit \$1. Mr. Ham.

The fundamental principles of physics important in the different branches of agriculture. Lect. 3; lab. 2.

301- 302. Electricity and Magnetism. Autumn and winter. 6 cr. Prerequisites Physics 201, 202, 203, 207, 208, 209, and Mathematics 201, 202, 203. Fee \$1; deposit \$1. Mr. Ham.

Methods for the exact measurements of resistance, electromotive force, current, capacity, and the coefficient of self-induction. Calibration of commercial instruments, insulation testing, and magnetic measurements. Lect. 2; lab. 1. Lect. 1; lab. 2.

303. Light and Sound. Spring. 3 cr. Prerequisites Physics 201, 202, 203, 207, 208, 209. Mr. Kiefer.

Theory of light in its application to familiar optical phenomena and to optical instruments. The phenomena and laws of sound. Lect. 3.

304. Kinetic Theory of Gases. Winter. 3 cr. Mr. Ham. Prerequisites calculus and two years of college physics.

Ideal gases by means of Maxwell's distribution law with special reference to the laws of Avogadro, Dalton, and the laws of thermodynamics. The equations which modify the ideal gas equations will be considered. Also different kinds of transport problems will be discussed.

305. Advanced Heat. Autumn. 4 cr. Prerequisites Physics 201, 202, 203, 207, 208, 209 or Physics 214, 215. Fee \$1; deposit \$1. Mr. Ham.

A continuation of the study of the laws of heat begun in courses 201, 202, and 203. Special attention will be given to methods of heat transmission, thermometry, specific heats and the laws of thermodynamics. Lect. 3; lab. 1.

309. Physical Measurements. Spring. 2 cr. Fee \$1; deposit \$1. Mr. Kiefer.

Laboratory course in light and sound to supplement physics 303. Lab. 2.

315. Pedagogy of Physics. Spring. 4 cr. Prerequisites Physics 201, 202, 203, 207, 208, 209, 303, 309. Mr. Ham.

Methods of teaching, the selection and performance of effective lecture table and laboratory experiments, and practice in presenting the topics covering such experiments to elementary and college classes. Lect. 4.

321. Meteorology. Spring. 4 cr. Mr. Ham.

Sources and measurements of atmospheric temperature, pressure and circulation of the atmosphere, measurement and movement of moisture, cause and prevention of frost. Part of the course will consist of a study of Montana weather bulletins. Lect. 4.

327. Electron Theory. Spring. 3 cr. Prerequisites Mathematics 201, 202, 203, ten credits of college physics. Mr. Ham.

Graduate course open to undergraduates who can satisfy the prerequisites. Not a survey course, but a discussion of recent research work. Lect. 3.

333. Diffraction Phenomena. Spring. 2 cr. Prerequisites Calculus and two years of college physics. Mr. Ham.

A mathematical discussion of wave motion and diffraction phenomena. The interpretation as given by Cornu's spiral will be included.

335. **Aeronautics.** Spring. 3 cr. Prerequisites Calculus, Physics, 201, 202, 203, 207, 208, 209. Mr. Kiefer.

A discussion of rigid and fluid mechanics of the airplane, motion in a resisting medium, harmonic motion, stability of the airplane, motion along a tube, forces on an airplane, stream function, and velocity potential.

POULTRY HUSBANDRY

PROFESSOR, W. F. SCHOPPE.

100. **Poultry Management.** Autumn. 4 cr.

Types and breeds of poultry, fancy and utility classification of fowls, principles of breeding, housing, feeding, incubation, and brooding, preparation for and marketing of poultry products. Lect. 3; lab. 1.

200. **Poultry Breeds.** Autumn. 3 cr.

Origin and development of the more important breeds of poultry, breeding fancy poultry. Preparation of birds for show. Judging by score card and comparison. Lect. 2; lab. 1.

300. **Systems of Poultry Housing.** Autumn. 3 cr. Taught only in even years. Lect. 2; lab. 1.

History and development of poultry housing, ventilation, distribution of light, etc. A comparison of the more modern systems of poultry housing as adapted to Montana conditions. Construction and arrangement of runs, yard, space required, etc. Arrangement of poultry plants, location of houses, yards, brooder, ranges, etc.

301. **Marketing Poultry Products.** Autumn. 4 cr. Fee \$1.

Preparation of poultry and eggs for market, storage, preservation, principles of marketing, killing, picking, and packing poultry, drawing, boning and trussing fowls for special market. Candling, grading and packing eggs. Lect. 3; lab. 1.

302. **Poultry Culture.** Winter. 3 cr. Fee \$1.

Breeds of poultry, their care, housing and feeding. Preparation, grading and packing poultry for market. Methods of marketing. Cold storage poultry. Selection of poultry for the table, drawing, trussing and boning. Candling, grading, and packing of eggs for market. Methods of marketing. Preserving eggs for future consumption, methods of storage and means of detecting storage eggs. Elective for junior and senior students in home economics. Lect. 2; lab. 1.

303. Incubation. Winter. 3 cr.

History and development of incubation; types of incubators; construction; ventilation; moisture control; operation of incubators; record keeping and pedigreeing. Lect. 2; lab. 1.

304. Brooding. Spring. 3 cr.

History and development of brooding; brooding systems; construction and operation of brooders; care and feeding of chicks. Lect. 2; lab. 1.

305. Poultry Feeds and Feeding. Autumn. 3 cr.

Feeds suited to poultry. Analysis of grain mixtures. Composition of feeds. Practice in mixing grain and grain rations. Taught only in odd years. Lect. 2; lab. 1.

306. Poultry Feeding. Winter. 3 cr. Prerequisite Poultry Husbandry 305.

Grain ration for egg production and fattening. Practice in feeding. Record keeping; computing costs; tabulating data. Taught only in odd years. Lect. 2; lab. 1.

400. Advanced Poultry Breeding. Winter. 3 cr. Prerequisite Zoology 302.

Breeding birds for show purposes; judging birds, selection and mating of birds for fancy and utility purposes. Lect. 2; lab. 1.

401-402-403. Thesis. Autumn, winter and spring. 6 cr.

Senior students in poultry husbandry may prepare a thesis on some subject approved by the head of the department not later than November 15.

SECRETARIAL STUDIES

PROFESSOR, R. O. WILSON. ASSISTANT PROFESSOR, W. B. HOLMES. INSTRUCTOR, DELLA YOUNG.

100-101-102. Shorthand. Autumn, winter and spring. Continuous. 6 cr. Miss Young.

Fundamental principles of shorthand practice in word-building, phrasing and dictation. Lect. 4.

103-104-105. **Typewriting.** Autumn, winter and spring. Continuous. 3 cr. Fee \$1. Miss Young.

Use and care of typewriters. Exercises for the development of proper wrist and finger movements, and for the mastery of the keyboard. Practice in letter writing and the use of carbon. Lab. 4.

200-201-202. **Shorthand.** Autumn, winter and spring. Continuous. 3 cr. Miss Young.

Practice in writing letters, legal papers, testimony, and miscellaneous matter. Students who take this course will also take Secretarial 203-204-205. Lect. 3.

203-204-205. **Typewriting.** Autumn, winter and spring. Continuous. 3 cr. Fee \$1. Miss Young.

Practice in transcribing from shorthand notes and from manuscript. Dictation for the attainment of speed and accuracy; practice in the use of the mimeograph. Students who take this course will also take Secretarial 200, 201, 202. Lab. 3.

206. **Business English and Correspondence.** Spring. 3 cr. Mr. Wilson.

207-208. **Commercial Law.** Autumn and winter. 6 cr. Mr. Holmes.

Students will be required to familiarize themselves with the rights and liabilities of parties to common business transactions, as contracts, sales, deeds, mortgages; and with the drawing up and validity of commercial paper and contracts. Text and cases. Lect. 3.

209-210-211. **Principles of Accounting.** Autumn, winter and spring. Continuous. 9 cr. Mr. Holmes.

Principles underlying accounting in general. Laboratory exercises. Lect. 1; lab. 2.

300. **Office Practice.** Spring. 3 cr. Miss Young.

Practice with various kinds of office appliances and equipment, such as adding machines, addressing machines, filing, etc. Lect. 1; lab. 1.

301-302-303. **Advanced Accounting.** Autumn, winter and spring. Continuous. 9 cr. Mr. Holmes.

The science of accounting will be taught from both the theoretical and practical standpoints. Corporation accounting will be introduced and cost accounting will be developed. The course will also include a study of different accounting systems with the object of fitting the students to plan or improve accounting systems for various types of businesses.

400-401. **Principles of Business.** Winter and spring. 6 cr. Mr. Holmes.

A treatment of business as a science, as a group of activities governed by laws and rules, whose relation to the other sciences is intimate. Consideration of scientific methods of financing and management as they may be applied to business. Analysis of financial statements. Lect. 3.

402-403. **Salesmanship and Business Efficiency.** Autumn, and winter. 6 cr. Mr. Holmes.

Fundamental principles and philosophy of human leadership, mental and business efficiency, and the science and art of salesmanship. Lect. 3.

VETERINARY SCIENCE

PROFESSOR, H. WELCH. ASSISTANT, W. J. HALL.

301. **Veterinary Physiology and Anatomy.** Autumn. 4 cr. Fee \$2.

Physiology and anatomy of domestic animals, digestion and assimilation of food, circulation and functions of the blood, respiration, the nervous system and organs of special sense. Muscles and phenomena of locomotion. Lect. 3; lab. 1.

302. **Pathology.** Winter. 3 cr. Prerequisite Veterinary Science 301.

Normal and pathological tissues, causes, course and sequelae of inflammatory processes, tumors, malformations, and the special pathology of the infectious diseases. Gross and microscopic specimens will be used for demonstration. Lect. 3.

303. **Obstetrics.** Spring. 3 cr.

Diseases of animals incident to reproduction. Gestation, normal parturition and dystokia, causes and treatment of sterility, care of the newborn. Illustrated by clinic cases. Lect. 2; clinic 1.

304. **Sanitary Science.** Spring. 3 cr. Prerequisite Bacteriology 201 or Veterinary Science 305.

Diagnosis, prevention, treatment, quarantine, methods of eradication of the infectious and contagious diseases of animals. Sanitation, the use of vaccines, serum diagnosis. Illustrated by field cases and clinic specimens. Lect. 3.

305. Common Diseases of Animals. Spring. 5 cr.

Diagnosis and first aid treatment of the common ailments of livestock. Demonstrations of minor surgical operations, treatment of wounds, and the use of the ordinary medicines and vaccines. Lect. 4; clinic 1.

306. Parasitic Diseases of Domestic Animals. Spring. 3 cr.

Diagnosis and treatment of the common parasitic diseases of livestock. Scabies of horses, cattle, sheep, and swine; lice and other skin parasites. Flies and fly larvae, roundworms, tapeworms and other common parasites. Illustrated by museum specimens, lantern slides and clinic cases when available.

School of Agriculture

The School of Agriculture offers practical instruction to the young men and women from the farms of Montana who wish to fit themselves for successful farming. The courses offered are intended as preparation for practical farm operation rather than for college entrance.

Students in this school have the privilege of studying a modern dairy in operation, including types of the best breeds of dairy cattle; a complete poultry plant in operation, containing breeds illustrating especially the best laying strains and market fowls; modern grain and soil laboratories; model farm buildings and barns, with purebred livestock; the experiment station farm, greenhouse and orchards; and the large biological, chemical and physical laboratories; well equipped wood and iron shops, farm machinery, tractor and gas engines. In so far as possible the veterinary courses include practical demonstration in treatment and care of sick and wounded stock.

The course extends through three years of six months each, and comes in the winter season, when the young men can be spared from farm work. For admission to the school, students must have passed the eighth grade or give satisfactory evidence to the principal of the school that they are capable of carrying on the work. Young men twenty-one years of age or over will be admitted to the course without having completed the eighth grade, provided they have had some practical experience on the farm and possess a fair common school education. Those who satisfactorily complete the course will be given certificates.

Unit courses in nearly all subjects in the School of Agriculture are provided for men under the Veteran's Bureau, because they come with various grades of preparation so that they do not fit into the regular classes.

SCHOOL OF AGRICULTURE

FIRST YEAR

	Autumn	Winter
English Exercises (Eng. a, b)	4	4
Elementary Physics (Phys. b)	5	
Farm Drawing (Agri. E. a, b)	2	2
Common Diseases (Vet. Sci. a)		4
Animal Types (An. Husb. a, b)	2	2
Farm Shop (Agri. E. c, d)	2	2
Military Science (Mil. Sci. a, b)	1	1

OPTIONAL

Plant Propagation and Tree Planting (Hort. a)	4	
Irrigation and Drainage (Agri. E. h)	4	
Industrial Arithmetic (Math. f)		5
Vegetable Gardening and Fruit Culture (Hort. b)		3
Farm Machinery (Agri. E. e)		3

SECOND YEAR

English Composition (Eng. c, d)	2	2
Elementary Chemistry (Chem. a)		5
Soils and Crops (Agron. a, b)	6	6
Breed Types (An. Husb. c-d)	2	2
Farm Tractors (Agri. E. f)	3	
Principles of Feeding (An. Husb. e)		2
Farm Dairy (Dairy a)	3	
Dairy Management (Dairy b)		3
Farm Poultry (Poultry a)	4	
Military Science (Mil. Sci. c, d)	1	1

THIRD YEAR

Composition and Literature (Eng. e, f)	2	2
Farm Management and Accounts (Agron. d)		4
Plant Diseases (Bot. a)		3
Feeding and Management of Dairy Cattle and Swine (An. Husb. f)	3	
Feeding and Management of Beef Cattle, Sheep and Horses (An. Husb. i)		3
Agricultural Economics (Econ. a)	3	
Rural Sociology (Soc. b)		3
Animal Breeding (An. Husb. g)	3	
Insect Pests (Ent. a)	3	
Farm Tractors (Agri. E. g)	5	
Military Science (Mil. Sci. e, f)	1	1

OPTIONAL

Dairy Manufactures (Dairy d)		3
Factory Management (Dairy c)		3
Infectious Diseases (Vet. Sci. b)		3
Parliamentary Law (Eng. g)		2

Total credits allowed in first and third years 20 to 22.

Departments of Instruction

AGRICULTURAL ENGINEERING

PROFESSOR, H. E. MURDOCK. INSTRUCTORS, R. M. MERRILL,
JAMES R. BARKER, F. L. GRIFFIN.

a, b. **Farm Drawing.** Autumn and winter. 4 cr. Mr. Griffin.

Elements of lettering; geometrical construction; isometric and orthographic representations, working drawings; farm building construction; bill of material; farm maps. Lab. 2. (Given in conjunction with agricultural engineering c, d.).

c, d. **Farm Shop.** Autumn and winter. 4 cr. Fee \$2; deposit, \$2 per quarter. Mr. Griffin.

Use of hand tools in carpentry; fitting and joining; forge work; use of heat with metals; drill press; repairing harness and machinery. Lab 2. (Given in conjunction with agricultural engineering a, b.).

e. **Farm Machinery.** Winter. 3 cr. Prerequisite Physics b. Mr. Merrill.

Types of farm machinery. Selection, adjustment and care of farm machinery. Modern farm conveniences, such as water supply systems, etc. Lect. 2; lab. 1.

f. **Farm Motors.** Autumn. 3 cr. Fee \$2; deposit \$2. Mr. Merrill.

Motors adapted to farm use, especially the gas engine, with practice in operating and locating troubles; engine types; single cylinder; timing, ignition and valve setting; carburetion. Lect. 1; lab. 2.

g. **Farm Tractors.** Autumn. 5 cr. Fee \$3; deposit \$2. Mr. Merrill.

Use of tractors on the farm. Overhauling, adjusting and repairing tractors. Operation. Lect. 1; lab. 4.

h. **Irrigation and Drainage.** Autumn. 4 cr. Mr. Barker.

Methods of irrigating and draining land. Lect. 3; lab. 1.

Courses Arranged for Veterans' Bureau Men

i. **Farm Mechanics.** 24 cr. Mr. Murdock, Mr. Merrill, Mr. Barker, Mr. Griffin.

A group course for secondary students desiring major work in farm mechanics.

i 1. **Elementary Mechanics.** Autumn. 6 cr. Lab. 6.

Farm machinery.

i 2. **Shop.** Winter. 6 cr. Lab. 6. Fee \$2; deposit \$2.

Wood work; forge; rope work.

AGRONOMY

PROFESSOR, CLYDE MCKEE. ASSISTANT PROFESSOR, H. R. SUMNER. INSTRUCTOR, I. J. JENSEN.

a. **Small Grains and Soils.** Autumn. 6 cr. Mr. Jensen.

Fundamental features of plant growth, elementary soil studies, soil types, structure, soil water, soil temperature, moisture conservation, tillage methods, acid and alkali soils. Cereal production. Practical studies of wheat, barley, oats and other small grains. Their production on dry and irrigated farms. Grain judging and the market classes of grain. Lect. 3; lab. 3.

b. **Corn and Forage Crops.** Winter. 6 cr. Prerequisite Agronomy a. Mr. Jensen.

A continuation of the studies of agronomy a. Corn production; its culture and uses. Management and care of meadows and pastures. Hay crops and hay making, forage crops for Montana; the production and handling of alfalfa, clovers, grasses, sorghums and other forage crops. Lect. 3; lab. 3.

Courses Arranged for Veterans' Bureau Men

k 1. **Wheat Production.** Autumn. 4 cr. Mr. Sumner.

Montana soils and climate and their effect on wheat production. The wheat plant and the essentials for its growth. The control of soil moisture for wheat varieties, culture, diseases, harvesting, and marketing of wheat. Lect. 2; lab. 2.

k 2. **Oats, Barley and Flax Production.** Winter. 4 cr. Mr. Sumner.

Methods for successful production of oats, barley, rye and flax. Control and identification of Montana weeds. Lect. 2; lab. 2.

k 3. **Corn and Forage Production.** Spring. 4 cr. Mr. Sumner.

Types and varieties of corn adapted to Montana. Cultural and harvesting methods for corn. Intertilled forage crops such as the sorghums and sunflowers in Montana. Lect. 2; lab. 2.

k 4. **Forage Production.** Summer. 4 cr. Mr. Sumner.

Hays and hay making. Range, pastures and meadow management. Lect. 2; lab. 2.

i 3. **Irrigation.** Spring. 6 cr. Lab. 6.

Drainage; buildings.

i 4. **Motors.** Summer. 6 cr. Lab. 6. Fee \$3.; deposit \$2.

Gas engines; tractors.

ANIMAL HUSBANDRY

PROFESSOR, C. N. ARNETT. ASSISTANT PROFESSOR, R. C. MCCORD
INSTRUCTOR, O. TRETSVEN.

a. **Animal Types.** Autumn. 2 cr. Fee \$1. Mr. Tretsven.

Market types of cattle and sheep. Lab. 2.

b. **Animal Types.** Winter. 2 cr. Fee \$1. Mr. Tretsven.

Judging of market types of dairy cattle, horses and swine.
Lab. 2.

c. **Breed Types.** Autumn. 2 cr. Fee \$1. Prerequisites Animal Husbandry a, b. Mr. McCord.

Breed types of cattle and sheep. Lect. 1; lab. 1.

d. **Breed Types.** Winter. 2 cr. Prerequisites Animal Husbandry a, b. Mr. McCord.

Breed types of dairy cattle, horses and swine. Lab. 2.

e. **Principles of Feeding.** Autumn. 2 cr. Fee \$2. Mr. Tretsven.

Nutrients and their functions, digestion, feeding standards, compounding rations, feeds and their adaptability.

f. **Feeding and Management of Dairy Cattle and Swine.** Autumn. 3 cr. Prerequisite Animal Husbandry e. Fee \$2. Mr. Tretsven.

Feeding and general management of purebred and grade dairy cattle and swine for production. Mr. Tretsven.

g. **Animal Breeding.** Autumn. 3 cr. Prerequisites Animal Husbandry c, d. Mr. McCord.

Principles of breeding as directly applied to the farm. Cross breeding, inbreeding, and line breeding. Lect. 2; lab. 1.

i. **Feeding and Management of Beef Cattle, Sheep and Horses.** Winter. 3 cr. Prerequisite Animal Husbandry e. Fee \$2. Mr. Tretsvén.

Feeding and general management of purebred and grade beef cattle, sheep and horses, considered for farm and range.

Courses Arranged for Veterans' Bureau Men

j. **Feeding and Management of Livestock.** 2 cr. Fee \$1. Mr. McMahon.

Deals with principles and practices of feeding and handling all classes of farm stock. Lect. 2.

k. **Livestock Judging.** Fee \$2.

Deals with general principles and practices of judging market animals and pure breeds of livestock.

BOTANY AND BACTERIOLOGY

PROFESSOR, D. B. SWINGLE. ASSISTANT PROFESSOR, H. M. JENNISON.

a. **Plant Diseases.** Winter. 3 cr. Fee \$1. Mr. Jennison.

Importance, symptoms, and methods of control of the more important diseases of plants. Lect. 2; lab. 1.

CHEMISTRY

PROFESSOR, W. M. COBLEIGH.

a. **Elementary Chemistry.** Winter. 5 cr. Fee \$4; deposit \$4.

Lectures with experimental illustrations, and recitations on general elementary chemistry. Special emphasis will be given to the applications of the science to daily life and to agriculture. Lect. 3; lab. 2.

DAIRY HUSBANDRY

PROFESSOR, G. L. MARTIN.

a. **Farm Dairying.** Autumn. 3 cr. Fee \$2; deposit \$1.

Factors in development and distribution of the dairy industry, importance of clean milk; care and handling of cream, operation of hand separators and preparation for market. Lect. 2; lab. 1.

- b. **Dairy Management.** Winter. 3 cr. Fee \$2; deposit \$1.

The factors influencing the composition and properties of milk and its products. Adulterations, fermentations, modifications, and ripening of cream. Manipulation of tests, manufacture of butter, cheese and ice cream, and the marketing of dairy products.

- c. **Management of Dairy Plants.** Winter. 3 cr. Fee \$2; deposit \$1.

Construction and equipping factories, receiving and handling manufactured products, utilization of by-products. Manipulation of machinery. Testing, scoring and marketing. Dairy records and accounts. Lect. 2; lab. 1.

- d. **Dairy Manufactures.** Winter. 3 cr. Fee \$2; deposit \$1.

Factory methods of making butter, cheese and frozen dairy products. Tests for composition, adulteration and standardization. Lect. 2; lab. 1.

Courses Arranged for Veterans' Bureau Men

- e. **Principles of Dairying.** 24 cr.

The history, scope, and development of the dairy industry, manufacturing, handling and utilization of dairy products. Public control and distribution of the milk supply. Lect. 4; lab. 2.

ECONOMICS

PROFESSOR, J. M. HAMILTON.

- a. **Agricultural Economics.** Autumn. 3 cr.

A study of such agricultural economic problems as the value and rent of land, farm labor, rural credit, cooperative buying and selling. Lect. 3.

- b. **Rural Sociology.** Winter. 3 cr.

The social problems of the open country, rural health and sanitation, the country church, the rural school, the means of communication and transportation, libraries and recreations. Lect. 3.

ENGLISH

INSTRUCTOR, MRS. B. F. DAVIS.

- a, b. **English Exercises.** Autumn and winter. 8 cr. Mrs. Davis.

Practice in spelling, punctuation, note taking, letter writing and the simple forms of composition. Lect. 4.

c, d. **English Composition.** Autumn and winter. 4 cr. Mrs. Davis.

The paragraph and its development; the news item and short news story; business forms; practice in oral and written composition.

e, f. **Composition and Literature.** Autumn and winter. 4 cr. Mrs. Davis.

Oral and written exercises in narration, description, exposition, and arrangement; current literature, use of the library.

g. **Parliamentary Law.** Winter. 2 cr. Mrs. Davis.

The principles of parliamentary law, the conduct of meetings, the organization of a society, the duties of officers, the recording of proceedings. The students will be given drill and actual practice. Lect. 2.

Classes for Veterans' Bureau men five groups in English (a, b) and two in English (c, d)

ENTOMOLOGY AND ZOOLOGY

PROFESSOR, R. A. COOLEY. INSTRUCTOR, O. A. SIPPEL.

a. **Insect Pests.** Winter. 3 cr. Mr. Cooley.

Consideration of the more important insect pests of Montana and the means of their control. Lect. 3.

b. **Beekeeping.** Autumn. 4 cr. Mr. Sippel.

Elementary beekeeping. Continuous. Lect. 2; lab. 2.

c. **Beekeeping.** Winter. 4 cr. Mr. Sippel.

Elementary beekeeping, continuous. Lect. 2; lab. 2.

d. **Beekeeping.** Spring. 4 cr. Mr. Sippel.

e. **Beekeeping.** Summer. 4 cr. Mr. Sippel.

Elementary beekeeping, continuous. Lect. 2; lab. 2.

f. **Beekeeping.** Autumn. 2 cr. Mr. Sippel.

Elementary beekeeping, briefer course, continuous. Lect. 3; lab. 1.

g. **Beekeeping.** Winter. 2 cr. Mr. Sippel.

Elementary beekeeping, briefer course, continuous. Lect. 1; lab. 1.

h. **Beekeeping.** Spring. 2 cr. Mr. Sippel.

Elementary beekeeping, briefer course continuous. Lect. 1; lab. 1.

FARM MANAGEMENT

PROFESSOR, E. L. CURRIER.

a. **Farm Management and Accounts.** Winter. 4 cr. Mr. Currier.

Fundamental principles involved in the successful organization and management of farms are considered. Lect. 2; lab. 1.

HORTICULTURE

PROFESSOR, F. M. HARRINGTON. ASSISTANT PROFESSOR, C. C. STARRING.

a. **Plant Propagation and Tree Planting.** Autumn. 4 cr. Fee \$1. Mr. Starring.

Plant propagation, with special reference to the methods of multiplying fruit and planting of trees. The latter part of the course deals with simple principles of ornamental planting and ornamental plants, and the growing of trees adapted to Montana conditions. Lect. 4.

b. **Vegetable Gardening and Small Fruit Culture.** Winter. 3 cr. Mr. Starring.

Methods of growing, gathering, storing, and marketing the more important vegetable crops; hotbed construction and management; and the growing of such small fruits as the strawberry, raspberry, blackberry, currant, and gooseberry. Lect. 3.

c. **Fruit Growing.** Autumn. 3 cr. Prerequisite Horticulture a. Mr. Starring.

Selecting sites, planning and planting, cultivation, irrigation, pruning, and general care of the orchard, more especially from the standpoint of the home orchard. Lect. 3.

d. **Home Gardening.** Winter. 3 cr. Mr. Starring.

Vegetable gardening, small fruit culture, and ornamental gardening. Lect. 3.

Courses Arranged for Veterans' Bureau Men

e 1. **Potatoes, Small Fruits.** Autumn. 2 cr.

Varieties, seed selection, cultural methods, harvesting, grading, etc. Lect. 1; lab. 1.

e 2. Small Fruits. Winter.

Varieties, planting, cultural methods, harvesting, etc., of such small fruits as the raspberry, strawberry, blackberry, currant, gooseberry, and grape.

e 3. Fruit Work. Spring.

The planting and management of young orchards up to the bearing age.

e 4. Summer Practices. Summer.

Summer work as applying to the lines outlined for the first three quarters.

Credit as stated for the course to apply to each quarter of work taken, in other words, it is possible to make eight credits in horticulture e by taking the four quarters of work.

f. Horticultural Practices. 4 cr. Lect. 2; lab. 2.

f. 1. Fruit Growing. Autumn.

Management and orchard practices in a bearing orchard, cultural methods, pruning, spraying, thinning, harvesting, grading, packing, etc.

f 2. Handling and Propagating of Trees, Shrubs, and Flowers. Winter.

Trees, shrubs, and flowers for Montana with their handling, place, etc., in the planting and arrangement of both the city property and farm home. Also methods of propagating same as well as other horticultural plants.

f 3. Vegetable Growing. Spring.

Vegetable growing, both from the home garden and commercial standpoint. Study of varieties, cultural methods, etc.

f 4. Vegetable Growing. Summer.

A continuation of the work of the spring quarter. It will include the actual growing and handling in so far as possible the vegetables suited to Montana.

MATHEMATICS

PROFESSOR, W. D. TALLMAN. INSTRUCTORS, FRIEDA BULL, B. LOWE.

b. Advanced Algebra. Autumn. 4 cr. Miss Bull.

Simultaneous quadratic equations, graphical representations of simple equations in two variables; theory of indices, (positive, negative, fractional, zero) radicals, etc. Lect. 4.

d. **Solid Geometry.** Spring. 4 cr. Prerequisite Mathematics b, c. Mr. Lowe.

Solid geometry with special attention to the geometry of the sphere. Lect. 4.

f. **Industrial Arithmetic.** Autumn. 5 cr. Mr. Lowe.

Fundamental processes of arithmetic related to home and farm experience. Mathematical problems connected with the work of the shop and laboratory. Lect. 4.

MILITARY SCIENCE

PROFESSOR, COL. V. A. CALDWELL. INSTRUCTOR, SGT. L. A. ELLSWORTH.

a, b. **Military Science.** Autumn and winter. 2 cr.

Refer to military science courses in the college for a description of this work and the courses that follow.

c, d. **Military Science.** Autumn and winter. 2 cr.

e, f. **Military Science.** Autumn and Winter. 2 cr.

PHYSICS

PROFESSOR, F. W. HAM. ASSISTANT PROFESSOR, J. A. KIEFER.

a. **Elementary Physics.** Autumn, winter and spring. Continuous. 12 cr. Mr. Kiefer. Fee \$1; deposit \$1.

Lectures with experimental illustrations, recitations, assigned problems, and laboratory work in mechanics, sound, heat, light, electricity and magnetism. Lect. 3; lab. 1.

b. **Elementary Physics.** Autumn. 5 cr. Mr. Ham.

Experimental lectures, recitations, and assigned problems on mechanics, heat, light and electricity. Emphasis will be placed upon those subjects that have a direct bearing on applied agriculture. Lect. 5.

POULTRY HUSBANDRY

PROFESSOR, W. F. SCHOPPE.

a. **Farm Poultry.** Autumn. 4 cr.

Various breeds and their adaptability to farm use. Housing, feeding, incubation and brooding. Judging birds, operating incubators and brooders. Lect. 3; lab. 1.

Courses Arranged for Veterans' Bureau Men**b. Poultry Production.** Autumn or winter or spring. 3 cr.

The principal breeds and classification of poultry and their breeding. Selection and preparation of birds for show. Culling for egg production. Principles of housing, feeding, incubation, and brooding. Use of artificial light to increase egg production. Methods of fattening, killing, picking, and packing poultry. Accounts and advertising. Lect. 3.

c. Laboratory Poultry Practice. Autumn or winter or spring. 3 cr.

Students registered for this course will be required to take Poultry b.

Practice in judging, preparation and fitting of birds for shows; culling for egg production; fattening, killing, picking and packing market poultry; candling, grading, and packing market eggs; packing hatching eggs; incubation and brooding; marketing baby chicks. All laboratory work will be made as practical as possible, and the different problems which the poultryman meets during the various seasons each year will be studied. Lab. 3.

VETERINARY SCIENCE

PROFESSOR, H. WELCH.

a. *Common Diseases of Animals. Winter. 4 cr.

For the stock grower, illustrating methods of diagnosis and treatment of the common ailments of domestic animals. First aid treatment of wounds and injuries; a brief course of instruction in obstetrical work and methods of handling cases of different parturition. Each division of the course is illustrated by actual cases as far as possible.

b. Infectious Diseases of Animals. Winter. 3 cr. Prerequisite Veterinary Science a.

Important and common infectious diseases of animals. Diagnosis, methods of prevention, quarantine regulations, and disease eradication methods.

Register of Students

1921-1922

GRADUATE STUDENTS

Graduate Students Candidates for Degrees

Barnard, R. B.	Electrical Engineering, Seattle, Wash.
Bonner, James H.	Civil Engineering Helena
Buck, Fred E.	Civil Engineering Helena
Farmer, Charles F.	Civil Engineering Missoula
Kitt, B. F.	Civil Engineering Missoula
Webster, R. Alden	Electrical Engineering, Wash., D. C.

Graduate Students Not Candidates for Degrees

Abbey, Myron J.	Agricultural Education Bozeman
Arnold, Melvin S.	Agricul. Ed. Salt Lake City, Utah
Baker, Noel	Agricul. Education.... St. Johns, Wash.
Barker, James R.	Applied Science Bozeman
Border, J. E.	Agricultural Education Bozeman
Brooks, Roland	Agricultural Education Sixteen
Burgess, Aline N.	Botany and Bacteriology Bozeman
Christopher, Warren N.	Botany and Bacteriology Bozeman
Cole, Albert B.	Agricul. Educ..... Frederickstown, O.
Dickman, Herman	Agricultural Education Glendive
Drewiecke, Leo A.	Agricultural Education.... DePere, Wis.
Dudley, Freda	Applied Science Bozeman
Felbaum, Max	Agricultural Education.. Blackfoot, Ida
Foote, Herbert B.	Civil Engineering Bozeman
Gray, J. Wright	Agricultural Education.... Lewistown
Griffin, F. L.	Applied Science Bozeman
James, J. S.	Civil Engineering Bynum
Kramer, Wilhelmina	Applied Science Butte
Larse, Victor F.	Agricultural Education Plains
McKenzie, Fred F.	Agricul. Education Marpole, B. C.
Mercer, Ralph D.	Agricul. Education Champaign, Ill.
Million, Herbert W.	Agricul. Education Monticello, Ind.
Morehart, Grover C.	Agricultural Education Wibaux
Morse, F. E.	Agricultural Education Troy, Pa.
Oliphant, Manford M.	Agricul. Education Pullman, Wash.
Owen, J. Q.	Applied Science Bozeman
Perrine, Leon	Agricultural Education Cascade

Pool, Gussie	Botany and Bacteriology	Bozeman
Preston, Alvin S.	Agricul. Education	Montford, Wis.
Quaw, Gene	Secretarial	Bozeman
Quinn, Edmund J.	Applied Science	Bozeman
Roberts, Otto P.	Agricultural Education	Bozeman
Robinson, Ernest	Agricultural Education	Lewistown
Saltz, L. W.	Agricultural Education	Bozeman
Scott, George A.	Agricultural Education	Chinook
Sewell, Lew P.	Agricultural Education	Stockett
Spogen, Leo R.	Agricultural Education	Belt
Sweat, Jack	Agricultural Education	Choteau
Therkelsen, Eric	Applied Science	Bozeman
Thompson, Wallace C.	Agricul. Education	Oakland, Pa.
Walker, John Paul	Agriculture	Bozeman
Warden, Robert P.	Agricultural Education	Broadview

COLLEGE STUDENTS

SENIORS

Alquist, Merrill J.	Civil Engineering	Conrad
Amer, William Ray	Mechanical Engineering	Anaconda
Asbury, Fuhrman A.	Agricultural Education	Bozeman
Auchstetter, Edna	Applied Art	Hinsdale
Bancroft, Helen Emily	Home Economics	Shepherd
Beatty, Lura M.	Home Economics	Bozeman
Becker, Norma Lena	Botany and Bacteriology	Bozeman
Bennett, William J.	Chemical Engineering	Anaconda
Bentall, Frank Maurice	Mechanical Engineering	Billings
Bergstrom, Arthur G.	Electrical Engineering	Bozeman
Black, Jesse C.	Civil Engineering	Whitehall
Bohart, Marjory	Botany and Bacteriology	Wilsall
Bole, Elizabeth	Bio-Chemistry	Bozeman
Bolles, Henry	Civil Engineering	Novary
Bowlen, Wayne F.	Electrical Engineering	Red Lodge
Briggs, Ian Albert	Agronomy	Conner
Briner, Ethel	Secretarial	Big Timber
Buckingham, William H.	Agricultural Education	Lavina
Buzard, Marion Frances	Home Economics	Bozeman
Callow, Merton Elroy	Electrical Engineering	Butte
Cameron, Ray Edison	Agricultural Education	Great Falls
Carey, Helen M.	Secretarial	Polson
Carter, Walter	Entomology & Zoology	Botha, Alta.
Chestnut, Ben Howard	Civil Engineering	Anaconda
Cline, John Fred	Agricul. Education	Springdale, Wash.

Clinkenbeard, Opal	Home Economics	Great Falls
Conklin, Melvin	Agricultural Education	Nina
Cooley, Charlotte Packard	Applied Art	Bozeman
Cruzen, Fred Tysseling	Electrical Engineering	Havre
Davidson, Hazel	Home Economics	Townsend
Dean, Richard Howell	Chemical Engineering	Bozeman
Degenhart, Frank H.	Electrical Engineering	Philipsburg
Ditty, Ethel Winnifred	Applied Art	Bozeman
Donohoe, Carroll Paul	Industrial Chemistry	Whitehall
Ebersole, Mary Ida	Home Economics	Glasgow
Egan, Mary Ursula	Applied Art	Butte
Ellingson, Henry Joseph	Electrical Engineering	Big Timber
Erdman, Wilson A.	Electrical Engineering	Libby
Forrest, Mildred Lois	Home Economics	Choteau
Forswall, Oscar Edwin	Electrical Engineering	Belgrade
Gagle, Roy H.	Entomology and Zoology	Great Falls
Gallihier, Vera Alice	Secretarial	Bozeman
Haines, Francis D.	Mechanical Engineering	Clancy
Hannah, Stanford	Agricultural Education	Bozeman
Harrer, Ruth Warren	Home Economics	Belgrade
Hibbert, Norman William	Agriculture	Chicago, Ill.
Holderby, Jess M.	Chemical Engineering	Bozeman
Holderby, Josephine	Industrial Chemistry	Bozeman
Hollier, Myrtle	Home Economics	Bozeman
Hollingsworth, Harley W.	Architectural Engineering	Bozeman
Husemeyer, William W.	Electrical Engineering	Bozeman
Jones, Wilma	Home Economics	Bynum
Jorgenson, Arthur Roy	Electrical Engineering	Helena
Kelly, Earl James	Electrical Engineering	Bozeman
Keown, Kathryn Bowers	Chemistry	Bozeman
Kirk, Albert B.	Agricultural Education	Elma, Wash.
Kruger, Arnold R.	Animal Husbandry	Plains
Leonard, Speed Stephens	Civil Engineering	Marshall, Mo.
Lillard, John Jordan	Agricultural Education	Bozeman
Lindsley, Marguerite	Bot. and Bac. Yellowstone Park, Wyo.	
Lippert, William Charles	Agricultural Education	Townsend
Lowman, Buford Jasper	Electrical Engineering	Darby
Luther, Merrill K.	Animal Husbandry	Bozeman
Mathews, Gladys Mary	Applied Art	Havre
Matthew, Emmet S.	Chemical Engineering	Bozeman
Matthew, Hollis W.	Animal Husbandry	Bozeman
McFarlin, Alfred Emmett	Mechanical Engineering	Dillon
McHugh, Lauretta Katherine	Applied Art	Lewistown
Mink, Leon Delmont	Animal Husbandry	Huntley
Morphey, Lloyd Alan	Elec. Engineering	Leadore, Ida.
Munson, Arthur Melton	Electrical Engineering	Clancy

Muntzer, Theo. V.	Home Economics	Butte
Neville, William Burnett	Electrical Engineering	Helena
Niemi, Leonard S.	Mechanical Engineering	Red Lodge
Noble, Dorothy Altha	Home Economics	Great Falls
Oleinik, Joseph Carl	Civil Engineering	Bearcreek
Omta, Anna M.	Home Economics	Bozeman
Paugh, John C.	Animal Husbandry	Ennis
Pietsch, Lloyd Charles	Agronomy	Bozeman
Pouder, Oliver Howard	Electrical Engineering	Bozeman
Preston, Edward C.	Electrical Engineering	Stevensville
Reed, Dorothy Marion	Home Economics	Windham
Ritschel, Eva	Home Economics	Wisdom
Robertson, Eugene	Bio-Chemistry	Bozeman
Ryan, Ambrose A.	Electrical Engineering	Great Falls
Sackett, Nona Elzina	Home Economics	Billings
Sayers, Leon D.	Chemistry	Bozeman
Sheffield, Dale C.	Mech. Engineering	Seattle, Wash.
Shoebbotham, Thomas B.	Chemical Engineering	Huntley
Smith, Franklin, Huston	Agricultural Education	Culbertson
Smith, Lois	Home Economics	Bozeman
St. Clair, Ward Kent	Electrical Engineering	Glasgow
Stranahan, Mary Jeanette	Applied Art	Havre
Sutherland, Sidney Samson	Agricultural Education	Polson
Tolman, Bronson D.	Animal Husbandry	Belfry
Trackwell, Rosemary	Home Economics	Bozeman
Tretsven, John Oscar	Animal Husbandry	Bozeman
Warden, Albert Walter	Agricultural Education	Bozeman
Watts, Willard J.	Mechanical Engineering	Anaconda
Wildman, Herbert	Secretarial	Knowlton
Williams, Jessie Iona	Home Economics	Clayton, Wash.
Willis, Philip A.	Mechanical Engineering	Roundup
Wylie, John	Civil Engineering	Bozeman
Wylie, Paul R.	Animal Husbandry	Bozeman
Young, Ethel Ellen	Home Economics	Bozeman

JUNIORS

Albrecht, Arno Carney	Civil Engineering	Great Falls
Alderson, William H.	Chemical Engineering	Bozeman
Allevato, William John	Electrical Engineering	Trident
Anderson, Emil A.	Civil Engineering	Kalispell
Barnum, Frank N.	Animal Husbandry	Columbia Falls
Beckley, Frank Ralston	Animal Husbandry	Chicago, Ill.
Bowen, Robert Mein	Electrical Engineering	Bozeman
Brown, Alva B.	Electrical Engineering	Moccasin
Brueckmann, Frank George	Civil Engineering	Polson
Buckingham, Earl M.	Civil Engineering	Ekalaka

Burgess, Dorothy Grace	Botany and Bacteriology	Bozeman
Campbell, John Paul	Agricultural Education	Bozeman
Cashmore, Herbert Dewey	Industrial Chemistry	Dillon
Cates, Edward Clinton	Horticulture	Victor
Cheney, Clark Thomas	Agricultural Education	Twin Bridges
Cline, Beatrice Marie	Applied Art	Bozeman
Cogswell, Edward B.	Chemistry	Helena
Cox, Chloe	Home Economics	Ballantine
Dahlstrom, Laura C.	Home Economics	Fromberg
Dean, Dorothy	Home Economics	Bozeman
Elmer, Roma C.	Industrial Chemistry	Bozeman
English, Mary M.	Home Economics	Dupuyer
Erwin, George Lewis	Agricultural Education	Bozeman
Felt, Herbert J.	Electrical Engineering	Anaconda
Ferrell, Lewis Joseph	Chemistry	Bozeman
Finley, George Vavesdall	Animal Husb.....	Mt. Vernon, Wash.
Fiscus, Adam E.	Mechanical Engineering	Bozeman
Fitzgerald, Keneth Wilson	Animal Husb.	Sioux City, Ia.
Flook, Bernice Oleta	Secretarial	Lewistown
Flook, Walter D.	Electrical Engineering	Lewistown
Ford, Ethan R.	Animal Husbandry	Bozeman
Foor, Forest	Agricultural Education	Wibaux
Gallagher, John Patrick	Civil Engineering	Hysham
Getchell, Wayne Thomas	Chemical Engineering	Bozeman
Gilbert, Leslie S.	Mechanical Engineering	Perma
Graham, Lloyd Lavern	Agricultural Education	Kalispell
Hagerty, Delia	Home Economics	Butte
Haines, Francis D.	Mechanical Engineering	Clancy
Hardy, Wellington C.	Mechanical Engineering	Forsyth
Hartley, Lloyd M.	Agricultural Education	Stockton, Ia.
Hoffman, Carl Rudolph	Chemical Engineering	Helena
Hollister, Bruce A.	Applied Science	Livingston
Houx, Lloyd J.	Agricultural Education	Whitehall
Husemeyer, Carl T.	Electrical Engineering	Warm Springs
Jones, Robert Rutherford	Animal Husbandry	Billings
Keeler, Marion A.	Secretarial	Crow Agency
Kennedy, Walter A.	Electrical Engineering	Missoula
Knight, Frank Henry	Agricultural Education	Bozeman
Lange, Herbert Leonard	Electrical Engineering	Bozeman
Leary, Wilfred John	Electrical Engineering	Butte
LeCornu, Paul Wright	Agronomy	Waverly, Wash.
Lyndon, Charles A.	Animal Husbandry.....	Lyndon, Alta.
Lyndon, William L.	Electrical Engineering.....	Lyndon, Alta.
Macdonald, Arthur E.	Animal Husb.	Opportunity, Wash.
MacDonald, Donald Leon	Agricultural Education	Butte
Marston, Eleanor Godfrey	Applied Art	Great Falls

Mashin, John Henry	Animal Husb.	Los Angeles, Cal.
McCann, Harry W.	Mechanical Engineering	Helena
McCarren, Ray Paul	Electrical Engineering	Anaconda
Michel, Magdalena E.	Home Economics	Bozeman
Mills, Frank A.	Agricul. Education	Rockdale, Ind.
Mitchell, Fergus G.	Animal Husbandry	Great Falls
Moebus, Marie Margaret	Home Economics	Butte
Moody, Alice C.	Home Economics	Butte
Moore, Cyril C.	Animal Husbandry	Bozeman
Moore, Knox Duncan	Chemistry	Billings
Mountjoy, Raymond	Agricultural Education	Kalispell
Nelson, Floyd Elsworth	Animal Husbandry	Martinsdale
Nelson, Zelma	Applied Art	Dillon
Neuman, Leonard J.	Electrical Engineering	Libby
Noble, Noneeta Leona	Secretarial	Great Falls
Oberle, Nicholas	Electrical Engineering	Bozeman
Olson, Elmer R.	Civil Engineering	McCabe
Orcutt, Edwin Paul	Animal Husbandry	Corwin Springs
Patterson, Joseph C., Jr.	Electrical Engineering	Dillon
Paulsen, Edward B.	Mechanical Engineering	Laurel
Peterson, Millard E.	Botany and Bacteriology	Culbertson
Plew, Maurine L.	Applied Art	Bozeman
Popham, William Lee	Agricultural Education	Victor
Radcliffe, Joseph H.	Chemical Engineering	Fairfield
Rassley, George A.	Agricultural Education	Bozeman
Richards, Albert B.	Secretarial	Big Timber
Rivenes, Alf	Electrical Engineering	Glendive
Rodriquez, Juan G.	Agronomy	Balincaquin, Pang, P. I.
Rodriquez, Mauro G.	Agronomy	Balincaquin, Pang, P. I.
Rouse, Robley Dixon	Mechanical Engineering	Libby
Schmid, Flora	Secretarial	White Sulphur Springs
Schreiner, Olive M.	Chemistry	Townsend
Sears, Thomas G. Arthur	Animal Husbandry	Bozeman
Smith, Floyd J.	Agricultural Education	Red Lodge
Smith, Wilbur Edward	Agricultural Education	Bozeman
Squier, Raymond J.	Electrical Engineering	Forsyth
Stacy, Clarence S.	Architectural Engineering	Bozeman
Stanton, Malcolm R.	Electrical Engineering	Plains
Steinbach, William Christian	Animal Husbandry	Wolf Creek
Stump, Fred	Electrical Engineering	Missoula
Swan, Leonard Russell	Agricultural Education	Livingston
Sweeney, Joseph A.	Agricultural Education	Chicago, Ill.
Tallman, Mildred Elizabeth	Applied Science	Bozeman
Tenney, Howard L.	Mechanical Engineering	Bozeman
Thomas, Richard R.	Electrical Engineering	Anaconda
Towne, Kathryn Mildred	Home Economics	Livingston

Van Fleet, George	Applied Science	Bozeman
Walker, Ruby Alma	Home Economics	Bridger
Walter, James Robert	Agricul. Education	Eagle Point, Ore.
White, Harold C.	Mechanical Engineering	Bozeman
Whitney, Wallace F.	Mechanical Engineering	Livingston
Williams, Hallam A.	Electrical Engineering	Anaconda
Williams, L. Vere	Agricultural Education	Bozeman
Winslow, Lawson Tracy	Animal Husbandry	Lewistown
Zacher, Vernon B.	Mechanical Engineering	Bozeman
Zuck, Merlin DaMore	Electrical Engineering	Flaxville

SOPHOMORES

Adams, Leola	Applied Art	Bozeman
Anderson, Donald	Secretarial	Lake Hamilton, Fla.
Asbury, Ralph L.	Electrical Engineering	Crow Agency
Astle, Thomas, Jr.	Chemical Engineering	Livingston
Atchison, Leonard W.	Mechanical Engineering	Salesville
Atterberry, Forrest	Secretarial	Lyman, Wash.
Avery, Steward Edward	Mechanical Engineering	Three Forks
Bailey, Evalyn Louise	Applied Art	Helena
Bailey, Lois	Architectural Engineering	Great Falls
Baldwin, Mary L.	Home Economics	Butte
Beck, Albert W.	Agriculture	Basin
Bell, Martin Averill	Agriculture	Wibaux
Bille, Stella	Home Economics	Bozeman
Blair, Dorothy	Applied Science	Bozeman
Bohart, Seth F.	Secretarial	Wilsall
Brentford, Harry Ellis	Electrical Engineering	Hamilton
Bright, George E.	Applied Art	Terry
Brim, Fred A.	Agriculture	Bozeman
Brittain, John H.	Civil Engineering	Billings
Buckby, Richard A.	Electrical Engineering	Butte
Bunney, William Edward	Chemical Engineering	Belfry
Burgess, Ormsby M.	Mechanical Engineering	Bozeman
Buzard, Walter Leslie	Applied Science	Bozeman
Callan, Thomas G.	Electrical Engineering	Anaconda
Cameron, Kathleen	Applied Science	Bozeman
Campbell, Margaret	Home Economics	Hardin
Carnes, Paul S.	Agriculture	Lewistown
Chase, Helen Elizabeth	Home Economics	Bozeman
Chrestenson, Gladys A.	Applied Art	Bozeman
Chrystal, Margaret Frances	Home Economics	Anaconda
Conkling, Margaret Elizabeth	Home Economics	Bozeman
Cottier, Glen Gordon	Architectural Engineering	Great Falls
Coulter, J. Ray	Chemical Engineering	Helena
Cowan, Franklin T.	Entomology and Zoology	Victor

Cowan, Jack Allen	Electrical Engineering	Bozeman
Cutting, H. Everett	Electrical Engineering	Bozeman
Davidson, Ruth Phillips	Home Economics	Townsend
Davies, Amy Louise	Applied Art	Great Falls
DeHart, Joseph Henry	Architectural Engineering	Helena
Duncan, Scotta Marie	Applied Art	Bozeman
Evans, James V.	Architectural Engineering	Edgar
Ewalt, Anita	Home Economics	Ekalaka
Finch, Carl Vivian	Electrical Engineering	Bozeman
Fiscus, Charles Brewer	Electrical Engineering	Bozeman
Flood, William G.	Agriculture	Bozeman
Ford, James Marion	Secretarial	Kalispell
Fox, Edgar B.	Electrical Engineering	Bozeman
Fox, Glen A.	Electrical Engineering	Livingston
Friedl, Zita C.	Home Economics	Glasgow
Gage, Perry R.	Architectural Engineering	Bozeman
Gaylord, Asa Kenneth	Electrical Engineering	Great Falls
George, Herbert Ernest	Electrical Engineering	Harlowton
Gleason, Jay L.	Industrial Chemistry	Missoula
Hall, Pruda Aline	Botany and Bacteriology	Bozeman
Hansen, Lloyd Darold	Electrical Engineering	Choteau
Hay, William D.	Agriculture	Hamilton
Heidelman, John Paul	Electrical Engineering	Ronan
Henrichsen, Jean G.	Agriculture	Sidney
Hollier, Stella	Secretarial	Bozeman
Holloway, John Parnell	Electrical Engineering	Bozeman
Howard, Lilla Josephine	Home Economics	Bozeman
Isaacs, Ivan Victor	Agriculture	Camps Pass
Johnson, Paul M.	Electrical Engineering	Silver Bow
Johnson, Theodore William	Chemical Engineering	Deer Lodge
Julio, Bert John	Civil Engineering	Red Lodge
Kendall, Helen Theresa	Industrial Chemistry	Bozeman
King, Charles S.	Mechanical Engineering	Forsyth
Kirk, Marie	Home Economics	Hillsboro, W. Va.
Kohl, W. E.	Agriculture	St. Peter, Minn.
Kohnen, Katherine	Home Economics	Missoula
Korslund, Harold D.	Secretarial	Bozeman
Kremer, Jessica Harriet	Home Economics	Laurel
Lage, James Edward	Electrical Engineering	Butte
Lauson, Mary Velma	Industrial Chemistry	Livingston
Lawton, McQueen	Secretarial	Vance, S. C.
Leckliter, Manila Belle	Applied Art	Salesville
LeCornu, George Donald	Agriculture	Waverly, Wash.
Lund, Gage	Industrial Chemistry	Bozeman
Macdonald, Janet	Home Economics	Butte
Mares, Joe R.	Mechanical Engineering	Helena

Mares, Lillian E.	Home Economics	Helena
Markin, Florence Lydia	Botany and Bacteriology	Bozeman
Mathews, Roland A.	Agriculture	Thompson Falls
Matthew, Lewis S.	Electrical Engineering	Augusta
Maxey, Margaret	Applied Art	Bozeman
Maxey, Mary	Industrial Chemistry	Bozeman
McClintock, Alice A.	Agriculture	Joliet
McCune, William Joseph	Chemical Engineering	Stevensville
McDermand, James W.	Electrical Engineering	Great Falls
McGandy, Edward Lewane	Civil Engineering	Minneapolis, Minn.
McLean, Thomas Wendell	Elec. Engineering	Harlowton, Mass.
McNall, Hazel Pauline	Home Economics	Bozeman
Menard, Alice Rosalia	Home Economics	Bozeman
Meredith, Claude Leon	Agriculture	Bozeman
Mikkelson, John H.	Secretarial	Bozeman
Moore, Emmett Burris	Civil Engineering	Bozeman
Moore, James William	Secretarial	Belgrade
Morse, Mildred	Secretarial	Bozeman
Nelson, Anna Isabel	Home Economics	Windham
Newell, Robert George W.	Agriculture	Stevensville
Newkirk, Thelma	Home Economics	Bozeman
Newkirk, Francis Floyd	Chemical Engineering	Bozeman
Nordstrom, Harriet Lucille	Applied Art	Big Timber
Otterson, Otto H.	Mechanical Engineering	Detroit, Mich.
Pace, Clark Roberts	Secretarial	Whitehall
Packer, Miriam H.	Secretarial	Miles City
Peltier, Vernie A.	Chemical Engineering	Eureka
Poorman, Mildred Venie	Chemistry	Nashua
Powers, Leroy	Agriculture	Ballantine
Quimby, Oscar Taylor	Industrial Chemistry	Helena
Quinn, L. Benjamin	Chemistry	Missoula
Refsnes, Nellie C.	Home Economics	Anaconda
Rivenes, Valborg A.	Applied Art	Glendive
Roberts, Jennie Grace	Applied Art	Bozeman
Rouse, James Byron	Agriculture	Libby
Rutter, Lewis H.	Electrical Engineering	Hinsdale
Savage, David A.	Agriculture	Worden
Schanck, Charles A.	Civil Engineering	Roberts
Schlosser, Agnes E.	Secretarial	Billings
Schrupp, Harold Jacob	Agriculture	Shepherd
Schurch, Charles F.	Chemical Engineering	Deer Lodge
Scott, Barbara Helen	Home Economics	Seattle, Wash.
Searle, Leonard Bereman	Agriculture	Valier
Shaw, Mary Madaline	Secretarial	Big Timber
Slawson, Donald B.	Mechanical Engineering	Billings
Sletten, Stella A.	Home Economics	Wibaux

Smith, Dorothy Lucille	Applied Art	Culbertson
Smith, Harlan Proctor	Applied Science	Bozeman
Sparrow, Wayne Frank	Electrical Engineering	Anaconda
Sprinkel, Russell	Secretarial	Springfield, Ill.
Staebler, Lucille	Applied Art	Butte
Storror, Andrew Gordon	Electrical Engineering	Butte
Stranahan, Alice	Home Economics	Fort Benton
Swanson, Florence Lillian	Botany and Bacteriology	Troy
Switzer, Ruth Marion	Secretarial	Jeffers
Tapp, Alta May	Applied Art	Pullman, Wash.
Taylor, Charles R.	Industrial Chemistry	Forsyth
Thomason, Howard H.	Mech. Engineering	Rumble Creek
Thompson, Robert Lynn	Chemical Engineering	Bozeman
Tootell, Dorothy	Industrial Chemistry	Great Falls
Udine, Edgar John	Entomology and Zoology	Great Falls
Vogt, Marie	Home Economics	Wibaux
Wagner, Joseph John	Chemical Engineering	Great Falls
Waite, Helen	Home Economics	Bozeman
Wallace, Harry McKay	Electrical Engineering	Deer Lodge
Williams, Hattie Marie	Secretarial	Townsend
Wilson, Edward E.	Mechanical Engineering	Lewistown
Willson, Virgil A.	Chemical Engineering	Virgelle
Willson, David S.	Mechanical Engineering	Virgelle
Wilton, Frank James	Secretarial	Bozeman
Winans, Marie Katherine	Secretarial	Livingston
Wylie, Ruth Dorothy	Applied Art	Bozeman
Young, Thomas R.	Agriculture	Great Falls
Zimdar, Elaska J.	Civil Engineering	Minneapolis, Minn.

FRESHMEN

Adams, Elmer Lee	Electrical Engineering	Hygiene, Col.
Adams, John Quincy	Mechanical Engineering	Bozeman
Allen, Gene William	Secretarial	Harrison
Almquist, Herman James	Electrical Engineering	Helena
Anderson, Donald	Electrical Engineering	Lewistown
Anderson, Jessie May	Home Economics	Belfry
Anderson, William David	Architec. Engineering	Bagley, Ia.
Asbury, Laura LaVonne	Home Economics	Crow Agency
Axtell, Eunice Mae	Home Economics	Salesville
Baker, Frances Marion	Secretarial	Three Forks
Baker, Maurice Warren	Industrial Chemistry	Broadview
Baker, William Street	Electrical Engineering	Choteau
Banks, Kenneth Erwin	Civil Engineering	Lavina
Barto, John R.	Mech. Engineering	Thompson Falls
Barwick, William James	Civil Engineering	Helena
Bates, Marion Edith	Secretarial	Denton

Bawden, William Edward	Civil Engineering	Seattle, Wash.
Baxter, George A.	Botany and Bacteriology.....	Utica
Beard, Wedworth L.	Botany and Bacteriology.....	Livingston
Beck, Esther Helen	Home Economics	Bozeman
Bell, Edward J., Jr.	Agriculture	Wibaux
Bender, Paul Revere	Electrical Engineering.....	Chrisney, Ind.
Bergey, Deskin Orval	Electrical Engineering	Whitefish
Bevans, Alice Ray	Home Economics	Helena
Black, Alice Pomeroy	Secretarial	Kalispell
Bonino, Violet Benedetta	Secretarial	Butte
Boss, John Wesley	Chemical Engineering	Belgrade
Bowling, Dorothy Adele	Applied Art	Washington, D. C.
Bowling, Ellen Rose	Applied Art	Washington, D. C.
Bowling, Joseph B., Jr.	Architec. Engineering.....	Wash., D. C.
Boyer, Glenn Clinton	Electrical Engineering	Missoula
Boyer, William Arthur	Electrical Engineering	Bozeman
Bradley, Carlin Keith	Electrical Engineering	Eureka
Branegan, Mrs. Robert.....	Home Economics	Bozeman
Bridgeman, Harry Sharpe	Civil Engineering	Great Falls
Briscoe, Anderson Stout	Electrical Engineering	Lewistown
Brown, Iris Marie	Applied Art	Hobson
Bryan, Marguerite	Secretarial	Belgrade
Burt, Wiliam R.	Bio-Chemistry	Bozeman
Butts, Fay Arthur	Secretarial	Fargo, N. D.
Buzard, Leonora	Secretarial	Bozeman
Callaghan, Eugene Joseph	Secretarial	Bozeman
Cameron, Donald W.	Secretarial	Bozeman
Campbell, Elizabeth Arline	Home Economics	Hysham
Campbell, Julia M.	Secretarial	Bozeman
Carter, Jackson Leaphart	Agriculture	Billings
Chamberlain, Walter L.	Mechanical Engineering	Laurel
Charles, Clarence D.	Electrical Engineering	Butte
Cheney, Lyle Howard	Industrial Chemistry.....	Twin Bridges
Christensen, Ivan Marlow	Electrical Engineering	Kalispell
Clarkson, George	Mechanical Engineering	Chinook
Cleveland, Alvin E.	Agriculture	Willow Creek
Cobleigh, Winnifred Merriam.....	Home Economics	Bozeman
Cok, Peter	Agriculture	Willard, Ohio
Conway, John H.	Civil Engineering	Bozeman
Cook, Mark Frederic	Mechanical Engineering	Billings
Cooley, Genevieve	Applied Art	Bozeman
Cooper, Forest Theodore	Agriculture	Darby
Copp, Frances E.	Secretarial	Eureka
Corwin, Genevieve M.	Home Economics	Park City
Cruzen, Hazel M.	Home Economics	Have
Dagnall, Luke Roddam	Agriculture	Miles City

Davis, Carl Russel	Electrical Engineering	Bozeman
Davis, William H.	Electrical Engineering	Bozeman
Davis, Evelyn	Secretarial	Bozeman
Deem, Mrs. Jean S.	Home Economics	Bozeman
Dehler, Hans Frank	Electrical Engineering	Helena
DeKay, Norman B.	Architectural Engineering	Helena
Demuth, Hazel M.	Applied Science	Bozeman
Dokken, Herman H.	Agriculture	Kenyon, Minn.
Dozois, Kenneth Pierre	Botany and Bacteriology	Roundup
Dozois, Theo F.	Mechanical Engineering	Roundup
Duncan, Louise Cora	Secretarial	Laurel
Durant, Josephine Pearl	Applied Art	Butte
Dutton, Grove Henry	Agriculture	Sumatra
Edwards, George B.	Agricul. Education	Beverley, Mass.
Ellison, Walter David	Civil Engineering	Fort Dodge, Ia.
Erickson, David W.	Civil Engineering	Missoula
Everling, Benedict Albert	Civil Engineering	Bozeman
Evers, Lillian Rowena	Secretarial	Fort Benton
Ferguson, Harold H.	Secretarial	Bozeman
Ferguson, Morgan John	Civil Engineering	Bozeman
Fischl, Beatrice Harrietta	Secretarial	Helena
Flanagan, Josephine	Home Economics	Absarokee
Forbes, Glenn Walter	Agriculture	Butte
Forbes, Jacob William	Botany and Bacteriology	Bozeman
Foutch, Paul Rhoades	Agriculture	Great Falls
Fowler, Francis F.	Mechanical Engineering	Darby
Fox, Louisa Marie	Applied Art	Bozeman
Fox, Shelda Pauline	Secretarial	Livingston
Frank, Harold Klein	Agriculture	Canton, Ohio
Frazer, Elizabeth A.	Secretarial	Billings
Friel, Agnes E.	Secretarial	Bozeman
Fulton, Daniel A.	Electrical Engineering	Ismay
Gallagher, Karl W.	Civil Engineering	Hobson
Gallagher, Maud C.	Applied Art	Anaconda
Gemberling, Gertrude Mary	Home Economics	Great Falls
Genty, Wilfred T.	Applied Science	Bozeman
Gibson, Gabriella E.	Secretarial	Bozeman
Gibson, Virgil Thomas	Mechanical Engineering	Missoula
Gilkerson, Mrs. T. J.	Home Economics	Bozeman
Graham, Alice Margaret	Home Economics	Butte
Graham, William M.	Electrical Engineering	Kalispell
Green, Vivian W.	Secretarial	Billings
Griffith, John Morris	Civil Engineering	Livingston
Guiglia, Sascha Fachetti	Agriculture	New York, N. Y.
Guillot, Clarence B.	Mechanical Engineering	Helena
Guthrie, Ina R.	Agriculture	Whitehall

Haley, William H.	Agriculture	Malden, Mass.
Hammerstrom, Agnes Olive	Home Economics	Rosebud
Hannah, Robert Bruce	Electrical Engineering	Big Timber
Hannon, Champ W.	Electrical Engineering	Darby
Harrer, Wilbert Joshua	Mechanical Engineering	Belgrade
Harris, Samuel F.	Civil Engineering	Bozeman
Hartig, Rudolph K.	Mech. Engineering	Waukesha, Wis.
Haskins, Bert Algernon	Applied Art	Livingston
Hatfield, Frank Richard	Electrical Engineering	Dillon
Haugland, Herbert Walter	Secretarial	Bozeman
Heal, Thomas Henry	Electrical Engineering	Bozeman
Hedke, Richard C.	Electrical Engineering	Billings
Hedman, Carl J.	Civil Engineering	Geyser
Henault, Steven S.	Electrical Engineering	Darby
Herrington, Barbour Lawson	Chem. Engineering	St. Marys, W. Va.
Hirsch, Carl Frank	Electrical Engineering	Helena
Holgren, Philip G.	Civil Engineering	Missoula
Holmes, Norma F.	Home Economics	Benchland
Holmquist, Caesar	Electrical Engineering	Valier
Hunt, Robert A.	Civil Engineering	White Sul. Spngs.
Jackson, Donald Tash	Industrial Chemistry	Twin Bridges
Jaqueth, Fred Dewey	Civil Engineering	Kalispell
Jensen, Johannes	Agriculture	Norway
Johnson, Arthur William	Agriculture	Staples, Minn.
Johnston, Sidney D.	Secretarial	Roundup
Joubert, Leonard N.	Agriculture	Fryburg, N. D.
Kellams, Olive R.	Home Economics	Bozeman
Kelley, Clair Ellen	Secretarial	Bozeman
Kelley, Beulah Faye	Secretarial	Hobson
Kelley, Georgia A.	Secretarial	Deer Lodge
Kerr, Russell D.	Agriculture	Victor
Keyes, Charles Robert	Electrical Engineering	Red Lodge
Kiehl, Clarence L.	Secretarial	Livingston
King, Elsbeth Barbara	Home Economics	Lewistown
King, Esther Judith	Applied Art	Lewistown
Kirk, Christine	Home Economics	Bozeman
Klebe, Lebrecht	Elec. Engineering	Gardena, N. D.
Kligora, Harry Jacob	Elec. Engineering	Seattle, Wash.
Kuhns, Edith	Botany and Bacteriology	Kalispell
Kurland, George James	Electrical Engineering	Butte
LaBonte, Fred Eugene	Electrical Engineering	Helena
Lamp, Paul Eugene	Civil Engineering	Big Timber
Landoe, Amanda	Secretarial	Bozeman
Lang, Harold Arthur	Chemical Engineering	Bozeman
Lange, Otto Fred	Agriculture	Bozeman
Langston, Dorothy Adelaide	Bio-Chemistry	Havre

Langworthy, Elizabeth Martha	Home Economics	Billings
Larsen, Winnie Sylvia	Botany and Bacteriology	Whitefish
Laughlin, Marjorie Jane	Applied Art	Miles City
Legge, Max	Agriculture	Dagmar
Lewis, Miles Everette	Agriculture	Bozeman
Link, Randolph G.	Mechanical Engineering	Billings
Lobdell, Marian E.	Secretarial	Belgrade
Logan, Frank Eugene	Agriculture	Melrose, Iowa
Long, Frederick Ellis	Agriculture	Hanover
Luther, Clark Andrew	Electrical Engineering	Worden
Machemer, Levi	Agriculture	Bozeman
Magruder, Paul Fred	Electrical Engineering	Glasgow
Maltby, LaVerna Sylvester	Applied Art	Wolf Point
Manry, Eldean M.	Home Economics	Bozeman
Manthey, Isabel Wilhelmina	Bio-Chemistry	Great Falls
Marquis, Octavia	Home Economics	Bozeman
Martin, Atha May	Applied Art	Harlowton
Marzetta, Petter N.	Chemical Engineering	Great Falls
Massuere, Marshall Page	Civil Engineering	Whitefish
Mathews, Jane Armstrong	Home Economics	Moore
Maylor, Marcellus Lindsay	Secretarial	Seattle, Wash.
McCall, Edith G.	Home Economics	Whitehall
McCarvel, Philip C.	Civil Engineering	Anaconda
McCay, Elmyra Jean	Home Economics	Bozeman
McConnell, Mary Velma	Applied Science	Lewistown
McCoy, Verl E.	Mechanical Engineering	Kinsey
McCune, Veronica Frances	Home Economics	Bozeman
McFerran, David Newton	Agriculture	Bozeman
McFerran, Harley Conrad	Agriculture	Bozeman
McGuin, Tracy A.	Electrical Engineering	Moore
McIver, Kenneth B.	Agriculture	Great Falls
McKenzie, Ella Mae	Home Economics	Miles City
McKenzie, Frank Stanley	Mechanical Engineering	Glendive
McLaughlin, Esther Mary	Applied Science	Stevensville
McMillan, Donald Angus	Agriculture	Glengarry
Meade, Henry D.	Agriculture	Billings
Meier, Gertrude Irene	Bio-Chemistry	Miles City
Meredith, Mable E.	Home Economics	Bozeman
Merkle, Catherine Mary	Home Economics	Belt
Miles, Edward Cann	Chemistry	Lonesome
Milne, Allen	Electrical Engineering	Somers
Mitchell, Aureola M.	Home Economics	Power
Mitten, Louis J.	Agriculture	Newton, Kansas
Moberg, Oscar Emil	Chemical Engineering	Livingston
Morris, Harold Freeman	Civil Engineering	Great Falls
Morrison, George E.	Electrical Engineering	Wilsall

Mosley, James W.	Agriculture	Polson
Murphy, Philip H.	Electrical Engineering	Whitehall
Neil, Mary Lavinia	Secretarial	Helena
Nelson, Margaret Louise	Secretarial	Windham
Neuman, Louis Bert	Agriculture	Odell, Neb.
Nicholson, Harold H.	Civil Engineering	Kalispell
Noble, Helen Charlotte	Agriculture	Great Falls
Oleinik, Oakla L.	Secretarial	Bear Creek
Osborn, Mrs. Cecilia	Home Economics	Bozeman
Otterson, Wade T.	Mech. Engineering	Detroit, Mich.
Parsons, William Lowell	Electrical Engineering	Billings
Patten, Margaret	Applied Art	Bozeman
Peets, Mrs. Mayme	Home Economics	Bozeman
Peterson, Knute L.	Mechanical Engineering	Helena
Peterson, Solomon	Agriculture	Bozeman
Phillips, Doris V.	Home Economics	Butte
Pitts, Eva E.	Secretarial	Bozeman
Potter, Edith Adell	Home Economics	McAllister
Powers, Elizabeth H.	Applied Science	Bozeman
Preskey, Harley L.	Architectural Engineering	Chinook
Prince, Frank William	Electrical Engineering	Troy
Quist, Carl Victor	Architec. Engineering	Mystic, Iowa
Raaen, Christ	Architectural Engineering	Norway
Ralston, Francis A.	Agriculture	Wise River
Randall, William M.	Mechanical Engineering	Wolf Point
Reagan, Charles E.	Electrical Engineering	Corvallis
Reddout, Carlie Arline	Applied Art	Poplar
Reed, Arthur C.	Civil Engineering	Bozeman
Refer, Svend	Mechanical Engineering	Bozeman
Reynolds, Archie	Agriculture	Bozeman
Richardson, Mary Irene	Applied Art	Bozeman
Rickard, Frank Niles	Mechanical Engineering	Bozeman
Rider, Gladys Muriel	Applied Art	Bozeman
Riley, Archie G.	Electrical Engineering	Great Falls
Rivenes, Solveig	Home Economics	Glendive
Robinson, Winnifred Frances	Applied Art	Bozeman
Ryan, Helen Marie	Home Economics	Great Falls
Sales, Walter Lewis	Agriculture	Manhattan
Sanford, Hollis	Agriculture	Great Falls
Sassaman, Gretchen	Applied Art	Everett, Wash.
Schneider, Virginia	Home Economics	Helena
Scotten, George F.	Electrical Engineering	Butte
Seely, Earl U.	Chemistry	Mirabile, Mo.
Shaw, Bradford Allen	Electrical Engineering	Livingston
Sippel, Mrs. O. A.	Home Economics	Bozeman
Slater, Harold Peter	Agriculture	Oeliveiu, Iowa

Smith, Fred M.	Electrical Engineering	Corvallis
Smith, George Thomas	Civil Engineering	Helena
Smith, Nicholas Nathaniel	Secretarial	Bozeman
Snedecor, Mary Mildred	Home Economics	Chinook
Sommerlad, Roy	Electrical Engineering	Livingston
Spain, Clarkson	Secretarial	Belgrade
Spain, Eva Louise	Secretarial	Belgrade
Spargo, Ethel May	Home Economics	Helena
Spaulding, George W.	Architectural Engineering	Bozeman
Stephens, Alonzo G.	Agriculture	Waterloo
Stephens, Mrs. C. B.	Home Economics	Bozeman
Stewart, Myrtle Antoinette	Home Economics	Butte
St. Jean, Albert Felix	Electrical Engineering	Anaconda
Straw, John Carl	Electrical Engineering	Forsyth
Street, Burnett Lillyn	Secretarial	Bozeman
Strobel, Irene L.	Home Economics	Helena
Suhr, Charles Edgar	Secretarial	Great Falls
Suvery, David A.	Mechanical Engineering	Bozeman
Swanson, Myrtle Lenea	Secretarial	Troy
Sybert, Florence Madelan	Home Economics	Livingston
Tallman, Hazel Bernice	Applied Science	Bozeman
Taylor, Archie G.	Electrical Engineering	Larb
Taylor, Mrs. Henry	Agriculture	Pony
Thayer, Victor Robert	Chemical Engineering	Helena
Thomas, Elizabeth M.	Home Economics	Billings
Tibbles, Mary Keturah	Home Economics	Rock Springs
Tidland, Gale Irene	Secretarial	Poplar
Tipton, Mrs. Mae E.	Home Economics	Bozeman
Todd, William W.	Mechanical Engineering	Bozeman
Tool, Eugene E.	Agriculture	Reed Point
True, Louis G.	Civil Engineering	Rapelje
Twilde, Knute	Electrical Engineering	Glendive
Vale, Harry P.	Mechanical Engineering	Billings
Van Rhee, John G.	Civil Engineering.....	St. Paul, Minn.
Vollmer, Henry J.	Architectural Engineering.....	E. Helena
Wagner, Ralph Roland	Electrical Engineering	Southern Cross
Walker, Lucien L.	Agriculture	Belt
Walsh, Ross Pat	Electrical Engineering.....	Three Forks
Ware, J. Henry	Civil Engineering	Park City
Webber, Roy S.	Industrial Chemistry.....	Big Timber
Welch, Charles G.	Electrical Engineering	Lambert
Wells, Cecil Kenneth	Civil Engineering	Kalispell
Werre, Ethel Lucille	Home Economics	Bozeman
West, Elsie M.	Bio-Chemistry	Poplar
Weydemeyer, Olga Campbell.....	Applied Art	Fortine
Weydemeyer, Winton William.....	Agriculture	Fortine

Whitacre, James Edward	Civil Engineering	Bozeman
Willis, Verna Marie	Home Economics	Bozeman
Winter, Rosebud Marie	Home Economics	Bozeman
Witchie, Louis Vincent	Agriculture	Miles City
Wood, Lysle A.	Mechanical Engineering	Terry
Woodward, Miriam Wilma	Secretarial	Bozeman

SCHOOL OF AGRICULTURE

FIRST YEAR

Adams, Sterling L.	Florence
Andries, Maurice Clements	Bozeman
Arnold, Clarence S.	Bozeman
Atwood, Earle N.	Glendive
Austin, John F.	Bozeman
Barnes, William H.	Missoula
Barta, George W.	Big Fork
Beard, Fred. C.	Vananda
Bettle, Lawrence L.	Myers
Boyer, Francis E.	Laredo
Bottler, Ernest	Emigrant
Caplis, Edmund	Missoula
Carlson, Ray E.	Bozeman
Carter, Frank Ervin	Lothair
Catelle, Joseph	Italy
Cawthorne, Garrett H.	Prairie Elk
Cox, Albert	Earlmount, Calif.
Cox, Carlos J.	Twin Bridges
Davenport, Cyrus R.	Barnard
Dipple, Grover L.	Kevin
Dodge, George M.	Content
Dollemore, George	Bozeman
Driscoll, Arthur F.	Emory, S. D.
Duffy, William D.	Canyon Creek
Dvornbos, Edward	Holland
Edman, Emil Eman	Sweden
Erickson, Fred C.	Chico, Calif.
Fairbanks, Frank R.	Geraldine
Feagins, Raymond O.	Bozeman
Fiscus, Grace Alice	Bozeman
Gaffke, Michael J.	Three Forks
Garcia, Earl B.	Ekalaka
Geise, Edward B.	Attica, N. Y.
Gilchrist, Edgar	Bozeman

Gilbert, Dudley	Clyde Park
Givens, Everett A.	Ontario, Canada
Granville, Russel J.	Luther
Gravesgaard, Nels	Denmark
Grotnes, Elinas	Sullivan
Gustafson, Conrad A.	Duluth, Minn.
Hamby, Robert L.	Ismay
Haugen, Obert L.	Seattle, Wash.
Hansen, Peter M.	Denmark
Harrison, Carl A.	Living Springs
Hefferman, Daniel J.	Elgin
Heinkel, George Fred	Minneapolis, Minn.
Hellman, William	Kolefield
Helmer, John M.	Poplar
Herbrich, Gustav	White Sulphur Springs
Hillstrand, Walter W.	Great Falls
Hoffman, Robert E.	Gascoyne, N. D.
Holmen, Eric G.	Jackson
Holzer, Carl	St. Ignatius
Hought, Edward	Menahga, Minn.
House, Earl A.	Clear Lake, S. D.
Hower, Edward W.	Minneapolis, Minn.
Isakson, Erling	Bozeman
Jacobs, Mark	Hedgesville
Jahns, Albert	Germany
Johnson, Al	Bozeman
Johnson, Axel M.	Neufelder, Minn.
Kampschneider, Ferdinand	Geyser
Kemp, John William	Buffalo
Kenck, Clarence B.	Livingston
King, Clayton R.	Bozeman
Kleppelid, Alfred	Weldon
Lake, Oscar Ludwig	Malta
Lane, Milton E.	Bozeman
Larkin, Rudolph A.	Carter
Lee, Jerome	Fort Logan
Leishman, Farrell H.	Drummond
Lockhart, Lawrence	Weldon
Lynch, Clarence F.	Arkansas, Kan.
Matteson, Melvin	Galata
McAfee, Montie Lee	White Sulphur Springs
McAvoy, James R.	New York, N. Y.
McCleery, Oral R.	Glasgow
McDonnell, Erval	Bozeman
McKinsey, William O.	Hubble
Mendel, Oren E.	Winifred

Metzgar, Chester A.	Torrington, Wyo.
Miles, James Joseph	Bozeman
Miller, Amos R.	Bozeman
Miller, Earl L.	Turner
Moody, Claude E.	Bozeman
Myers, Charles E.	Auburn
Neufelder, Carl	Evansville, Ind.
O'Brien, Joseph V.	Victor
O'Farrell, John	Lambert
Olson, Harvey A.	Lotnair
Osgood, John James	Chalk Buttes
Overfelt, Leo	Big Timber
Patchett, Alfred F.	Lothair
Pederson, Alfred E.	Denmark
Peets, Earl E.	Bozeman
Perry, Ray J.	Alder
Phillippi, Albert J.	Ferguson, Iowa
Ping, Harland W.	Bozeman
Rath, Ralph A.	Sidney
Redcher, John G.	Custer
Redpath, George Arthur	Wayzata, Minn.
Reed, Milton	Tacoma, Wash.
Rhea, William T.	Bainville
Riddle, Howard F.	Rockton, Pa.
Riddle, William E.	Bozeman
Ries, Jesse A.	McHessor
Robertson, Lester H.	Bozeman
Rodenberg, Harry John	Metropolis, Ill.
Rudd, Rudolph	Van Norman
Rumelhart, George W.	Ekalaka
Sales, John Arthur	Bozeman
Schillinger, L. B.	Vida
Schweder, Oscar F.	Billings
Semenze, Silvid A.	Fort Benton
Shalech, Alfonse	New York, N. Y.
Siegel, Leo	Bozeman
Slocum, Merritt	Eugene, Ore.
Staples, Lee	Spokane, Wash.
Steensland, Knute A.	Norway
Trueblood, William J.	Malta
Vanek, Rudolph H.	Brooks
Vanek, Frank W.	Brooks
Van Horn, Henry	Donnelly
Van Voast, George W.	Turner
Walsh, Thomas P.	Chinook
Weaver, James F.	Revere, Wash.

Wheeler, Robert L.	Bozeman
White, Slowman E.	Dixon
Williams, John F.	Radersburg
Wolfe, Earle I.	Box Elder
Woodard, Ernest H.	Butte
Young, Clarence B.	Lewistown

SECOND YEAR

Campbell, Arlo G.	Grandview, Wash.
Collins, Milo	Reed Point
Eklund, Frank I.	Bozeman
Galloway, Carl V.	Logansport, Ind.
Gruel, Carl A.	Boyd
Loehding, Peter	Ekalaka
Mayo, Carl M.	Laredo
Miles, Jerry R.	Lonesome
Peeters, Petrus	Simpson
Peterson, Johannes	Crane
Ronan, Paul E.	Laurel
Sensabaugh, Walter	Newark, Ohio
Stoll, Harvey L.	Myers
Swanson, Olaf	Bozeman
White, Joseph H.	Malone, N. Y.
Williams, William O.	Sheridan, Wyo.
Winter, William H.	Bozeman
Young, George C.	Bozeman

THIRD YEAR

Burns, George	Caledonia, N. Y.
Breiner, Leland S.	Missoula
Buttleman, John	Willow Creek
Cooper, Howell R.	Willow Creek
Gallis, Ole	Kalispell
Harbo, Roald	Froid
Harlan, George	Bozeman
Henneberry, William	P. E. Island, Canada
Hough, Ray A.	Portland, Ore.
Jewell, Earl	Randall, Wis.
Karlsson, Aron G.	Sweden
Kennedy, Frank R.	Ennis
Kuehne, Fred C.	Riverside
Larkin, Edward T.	Chinook
Lee, Hjalmar	Culbertson
Lee, Oliver C.	Culbertson
Neill, Frank D.	Helena
Riek, Hilmore W.	Scobey

Seeman, Gerritt	Bozeman
Sutherland, Walter I.	Great Falls
Vander Veen, Rinse	Shepherd

SCHOOL OF MUSIC

Adams, Leola	Piano	Bozeman
Alexander, Maud	Piano	Bozeman
Bailey, Evalyn	Voice	Helena
Bancroft, Helen	Voice	Shepherd
Blair, Dorothy	Violin, Harmony, Theory.....	Bozeman
Blish, M. J.	Violin	Bozeman
Bohart, Marjory	Piano, Harmony, Theory.....	Wilsall
Brentford, Harry	Piano	Hamilton
Bright, Mrs. Margaret	Voice	Bozeman
Brittain, Mrs. A.	Voice	Bozeman
Brown, Alva	Piano	Moccasin
Brown, Esther	Piano	Bozeman
Brown, Iris	Voice	Hobson
Brueckmann, Frank	Voice	Polson
Bunney, Edward	Piano, Harmony, Theory.....	Belfry
Burgess, Dorothy	Piano	Bozeman
Burgess, Aline	Voice	Bozeman
Burke, Edmund, Jr.	Piano	Bozeman
Carter, Walter	Voice	Botha, Alta.
Chase, Helen	Piano	Bozeman
Chrystal, Margaret	Piano	Anaconda
Cline, Marie	Piano	Bozeman
Clinkenbeard, Opal	Voice	Great Falls
Cobleigh, Winnifred	Piano	Bozeman
Cochran, Hazel	Piano	Bozeman
Cooley, Charlotte P.	Voice	Bozeman
Cox, Chloe	Piano	Ballantine
Dahlstrom, Laura	Piano	Fromberg
Dean, Dorothy	Piano	Bozeman
Degenhart, Frank	Violin	Philipsburg
Ditty, Ethel	Voice	Bozeman
Dudley, Frieda	Piano	Bozeman
Egan, Mary U.	Voice	Butte
Elmer, Roma	Piano, Harmony, Theory.....	Bozeman
Ennis, Olive	Voice	Bozeman
Flook, Bernice	Voice	Lewistown
Garry, Esther	Voice, Harmony, Theory.....	Lewistown
Gleason, Jay	Piano, Harmony, Theory.....	Missoula
Griffin, Fred	Voice	Bozeman

Hall, Pruda	Piano	Bozeman
Hammerstrom, Agnes	Voice, Harmony, Theory.....	Rosebud
Harrer, Ruth	Voice	Belgrade
Harrington, Mrs. L. R.	Voice	Bozeman
Haskins, Mary	Voice	Bozeman
Henegan, Wanda	Piano, Harmony, Theory	Bozeman
Hibbert, Norman	Voice	Chicago, Ill.
Hollier, Myrtle	Piano, Voice, Har., Theo.....	Bozeman
Hollier, Stella	Violin	Bozeman
Holloway, John P.	Piano	Bozeman
Howard, Josephine	Violin, Harmony, Theory.....	Bozeman
Hutchinson, Helen	Voice	Bozeman
Jones, Wilma	Voice	Bynum
Kendall, Helen	Piano	Bozeman
Keown, Kathryn	Voice	Bozeman
King, Elsbeth	Voice	Lewistown
King, Esther	Piano	Lewistown
Kinsey, Olive	Voice	Bozeman
Kirk, Marie	Piano	Hillsboro, W. Va.
Kyle, Frances	Voice	Bozeman
Langston, Dorothy	Piano, Harmony, Theory.....	Havre
Leckliter, Manila	Voice	Salesville
Lehrkind, Rosalia	Piano, Harmony, Theory.....	Bozeman
Lund, Gage	Voice	Bozeman
MacDonald, Janet	Piano, Harmony, Theory	Butte
Mares, Joe	Piano	Helena
Markin, Florence	Piano	Bozeman
Marston, Eleanor	Voice	Great Falls
Mathews, Gladys	Voice	Havre
Maxey, Margaret	Piano	Bozeman
Maxey, Mary	Piano	Bozeman
Maxey, Mrs. J.	Harmony and Theory.....	Bozeman
Maxwell, Lora	Voice	Bozeman
Maxwell, Mirdyaleen	Piano	Bozeman
McCann, Harry	Piano	Helena
McMahon, A. L. Mrs.....	Violin	Bozeman
Merkle, Catherine	Voice	Belt
Mitchell, Alberta	Piano	Bozeman
Moebus, Marie	Piano	Butte
Moody, Alice	Voice	Butte
Morgan, Geraldine	Piano	Bozeman
Mountjoy, Raymond	Voice	Kalispell
Muntzer, Theo	Voice	Butte
Noble, Noneeta	Piano	Great Falls
Nordstrom, Harriet	Piano	Big Timber
Oleinik, Oakla	Piano	Bearcreek

Page, Teresa	Piano	Bozeman
Patten, Margaret	Voice	Bozeman
Patten, Mary	Violin	Bozeman
Paxton, Genevieve	Piano	Bozeman
Peterson, Millard	Voice, Harmony, Theory.....	Culbertson
Plew, Maurine	Voice	Bozeman
Quimby, Oscar	Piano	Helena
Radcliffe, Joseph	Violin	Windham
Reed, Dorothy	Piano	Fairfield
Rider, Maude	Piano	Bozeman
Ritschel, Eva	Piano	Wisdom
Rivenes, Valborg	Piano	Glendive
Robie, Evelyn	Violin	Bozeman
Rutter, William	Violin	Hinsdale
Sackett, Nona	Voice	Billings
Sanborn, Mrs.	Piano	Bozeman
Schmid, Flora	Violin	White Sulphur Springs
Schneider, Virginia	Piano	Helena
Schreiner, Olive	Piano	Townsend
Scotten, George	Voice	Butte
Shaw, Madeline	Piano, Voice	Big Timber
Smith, Dorothy	Voice	Culbertson
Smith, Lois	Piano	Bozeman
Staebler, Lucille	Voice	Butte
Stephens, Ruth	Piano	Bozeman
Stranahan, Alice	Piano, Harmony, Theory.....	Fort Benton
Stranahan, Mary	Piano	Havre
Swanson, Florence	Piano	Troy
Sweeney, Joseph	Voice	Chicago, Ill.
Sybert, Madelan	Voice	Livingston
Tallman, Mildred	Voice	Bozeman
Tenney, Howard	Piano	Great Falls
Thompson, Doris	Piano	Bozeman
Towne, Katherine	Voice	Livingston
Trackwell, Rosemary	Voice	Bozeman
Walker, Ruby	Voice	Bridger
Willis, Verna	Piano, Voice	Bozeman
Willson, David	Voice	Virgelle
Willson, Virgil	Voice	Virgelle
Wilson, Elaine	Piano	Elridge
Young, Ethel	Piano	Bozeman
Zacher, Vernon	Voice	Bozeman

SUMMER SESSION OF 1921

Aitken, Malcolm D.	Agricul. Ed.	Mt. Hamilton, Cal.
Alexander, Violet	Art	Bozeman
Andresen, Ollene	Summer Session	Elgin, Ill.
Arnett, Mrs. Ethel B.	Summer Session	Bozeman
Arnold, Katherine	Applied Art	Terre Haute, Ind.
Asbury, Fuhrman	Agricul. Ed.	Crow Agency, Mont.
Bailey, Lois	Architectural Engr.	Great Falls
Barnes, Wm. H.	Federal Board	Bozeman
Beach, Benjamin	Agricultural Education	Bozeman
Beatty, Dorothy D.	Summer Session	Bozeman
Becker, Norma L.	Botany and Bacteriology.	Bozeman
Bergstrom, Arthur E.	Federal Board	Bozeman
Bice, Clarence	Federal Board	Bozeman
Binner, Mrs. Teresa C.	Summer Session	Bozeman
Binner, Roger	Federal Board	Bozeman
Blair, Dorothy	Summer Session	Bozeman
Bole, Elizabeth	Chemistry	Bozeman
Bollinger, Ruth	Summer Session	Bozeman
Bottler, Ernest L.	Federal Board	Bozeman
Bradford, Loren O.	Architectural Engr.	Livingston
Brainard, Anna May	Music	Bozeman
Brentford, Harry	Federal Board	Hamilton
Brewer, Gertrude D.	Summer Session	Bozeman
Brewer, Helen A.	Summer Session	Bozeman
Brown, Esther	Music	Bozeman
Buckingham, Wm. H.	Federal Board	Lavina
Burns, George	Federal Board	Caledonia, N. Y.
Bush, E. J.	Summer Session	Pony
Buzard, Leonora	Summer Session	Bozeman
Campbell, Arlo G.	Federal Board.	Grandview, Wash.
Campbel, Ralph D.	Summer Session	Bozeman
Caplis, Edmund	Federal Board	Missoula
Chrestensen, Gladys	Applied Art	Bozeman
Clark, Ella L.	Summer Session	Bozeman
Clary, Mrs. Ruth Vreeland	Summer Session	Bozeman
Cline, Beatrice Marie	Applied Art	Bozeman
Cline, J. Fred	Agricul. Ed.	Springdale, Wash.
Cok, Peter	Federal Board	Willard, Ohio
Collins, Milo	Federal Board	Reed Point
Conklin, Melvin J.	Agricultural Education	Oswego
Conway, John H.	Federal Board	Bozeman
Cutler, Anna C.	Summer Session	Des Moines, Ia.
Davis, Lela A.	Summer Session	Burbank, Calif.
Davis, Mrs. Beatrice F.	Summer Session	Bozeman

Deem, Jean Swartz	Summer Session	Bozeman
Ditty, Winnifred Ethel	Applied Art	Lewistown
Dodge, George M.	Federal Board	Content
Dollemore, George	Federal Board	Bole
Donaldson, Hallie R.	Summer Session	Anad
Drewiecke, Leo A.	Agricul. Education.....	De Pere, Wis.
Dringle, Emma L.	Summer Session	Norris
Dutton, Grove	Federal Board	Slayton
Ebersole, Mary Ida	Home Economics	Glasgow
Ellison, Walter D.	Federal Board	Bozeman
Fiscus, Adam E.	Federal Board	Bozeman
Fiscus, Charles Brewer	Federal Board	Salem, Ore.
Flood, Wm. G.	Federal Board	Bozeman
Foor, Forest L.	Agricul. Ed.....	Canal Winchester, O.
Foree, Eula E.	Summer Session	Epsie
Forswall, Lena	Music	Belgrade
Forswell, O. E.	Electrical Engineering	Bozeman
Fox, Edgar B.	Federal Board	Bozeman
Galloway, Carl V.	Federal Board.....	Logansport, Ind.
Garrett, John Milton	Agricultural Educatoin...	Moulton, Ia.
Geary, Cornelia Mary	Summer Session	Deer Lodge
Geisdorff, Charlotte	Summer Session	Wahpeton, N. D.
Goman, Andrew J.	Federal Board	Reed Point
Gravesgard, Nels	Federal Board	Shawnut
Greenhavick, Alexander	Federal Board	Mwcke, Russia
Griffin, Fred L.	Summer Session	Bozeman
Haley, William H.	Federal Board	Malden, Mass.
Hannah, Stanford	Agricultural Education	Bozeman
Hartig, Rudolph K.	Federal Board	Wankeda, Wis.
Heal, Thos. H.	Federal Board	Bozeman
Henneberry, Wm.	Federal Board	Bozeman
Henry, Lloyd	Agricul. Education ...	Wonewoc, Wis.
Hinman, Ruth E.	Summer Session	Bozeman
Holderby, Josephine	Chemistry	Bozeman
Hollister, Bruce	Mechanical Engineering ...	Livingston
Holloway, John P.	Summer Session	Bozeman
Huff, John F.	Federal Board	Kathiemay
Husemeyer, Wm. W.	Electrical Engineering	Bozeman
Isaacs, Ivan	Federal Board	Camps Pass
Jacob, Mark	Federal Board	Bozeman
Jelinek, Lillian	Summer Session.....	Crete, Nebr.
Jensen, Johannes	Federal Board	Norway
Johns, Albert	Federal Board	Biddle
Johnson, Frank R.	Agriculture	Bozeman
Johnson, Mrs. Grace L.	Summer Session	Bozeman
Johnson, L. Ross	Summer Session	Bozeman

Johnston, Sidney	Federal Board	Bozeman
Jones, Robert D.	Agricultural Education	Great Falls
Jones, Robert R.	Agricultural Education	Billings
Kennedy, Frank R.	Summer Session	Hillsboro, Ore.
Keyes, Ethel A.	Home Economics	Bozeman
Kirk, Albert	Agricul. Education	Hillsboro, W. Va.
Kirk, Christine	Summer Session	Bozeman
Kische, Leo R.	Summer Session	New London, Wis.
Kuehne, Fred C.	Federal Board	Bozeman
La Bonte, Fred	Federal Board	Helena
Lange, Herbert	Electrical Engineering	Bozeman
Lange, Otto	Federal Board	Bozeman
Lantz, Henry L.	Federal Board	Bozeman
LeCornu, Paul W.	Agricul. Ed.	Opportunity, Wash.
Lestrud, Mayvid K.	Summer Session	Choteau, Mont.
Lillard, John J.	Agricultural Education	Bozeman
Lindseth, Joseph	Agricultural Education	Brady
Lippert, Wm. C.	Agricultural Education	Townsend
Loehding, Peter	Federal Board	Bozeman
Lowe, Burdette H.	Summer Session	Sullivan, Ohio
Luther, Mrs. Grace R.	Summer Session	Luther
MacDonald, Donald L.	Agricultural Education	Butte
Madden, Thelma Chase	Summer Session	Bozeman
Malm, Oliver	Music	Bozeman
Mashin, Ladimir	Agricultural Education	Los Angeles
Mason, Marshall T.	Summer Session	Bozeman
Maxey, Laura May	Music	Bozeman
Mayo, Carl M.	Federal Board	Bozeman
McClintock, Alice	Home Economics	Joliet
McMullin, Glen W.	Summer Session	Worden
Meredith, Claude	Federal Board	Bozeman
Michel, Magdaline E.	Home Economics	Bozeman
Miles, James Joseph	Summer Session	Bozeman
Mitchell, Alberta	Music	(Bozeman
Moody, Claude Elmer	Federal Board	Emory
Mullen, Margaret	Summer Session	Deer Lodge
Munson, Arthur Milton	Electrical Engineering	Clancy
Murphy, Regina	Summer Session	Whitehall
Neuman, Louis Bert	Federal Board	Odell, Nebr.
Omta, Anna	Home Economics	Bozeman
Parkin, Mila	Summer Session	Bozeman
Paugh, John C.	Agricultural Education	Jeffers
Pencoff, Daniel	Federal Board	Lewistown
Peterson, Solomon	Federal Board	Bozeman
Philo, Clifford A.	Federal Board	Bozeman
Pietsch, Lloyd Chas.	Agronomy	Bozeman

Plew, Maurine	Applied Art	Bozeman
Purdum, Elizabeth F.	Summer Session	Bozeman
Raaen, Chris	Federal Board.....	Wikersand, Norway
Rabe, Hazel H.	Summer Session	Bozeman
Rath, Ralph	Federal Board	Bozeman
Reed, Milton	Federal Board	Tacoma, Wash.
Refer, Selma Catherine	Summer Session	Bozeman
Refer, Svend	Federal Board	Bozeman
Reynolds, Archie	Federal Board	Takota, N. D.
Riley, George	Federal Board	Bozeman
Roberts, Jennie	Summer Session	Bozeman
Robertson, Esther	Summer Session	Bozeman
Rose, Helen	Summer Session	Bozeman
Rounds, B. Willis	Federal Board	Malta
Rumelhart, George W.	Federal Board	Ekalaka
Russell, Mrs. Carrie Todd.....	Summer Session	Salesville
Ryan, Ambrose	Summer Session	Great Falls
Sayers, Leon D.	Chemistry	Bozeman
Schneider, August Mills	Summer Session	Helena
Sensabaugh, Walter	Federal Board	Newark, O.
Sletten, Stella	Summer Session	Wibaux
Smith, Franklin H.	Agricultural Education	Culbertson
Smith, Fred M.	Federal Board	Corvallis
Smith, Lois	Home Economics	Bozeman
Smith, Ruth	Summer Session	Bozeman
Smith, Wilbur E.	Agricultural Education	Bozeman
Stark, A. P.	Summer Session	Bozeman
Steensland, Knute	Federal Board	Nashua
Stimson, Maynard S.	Summer Session	Bozeman
Storror, Andrew	Federal Board	Bozeman
Swanson, Olaf	Federal Board	Bozeman
Tallman, Mildred	Summer Session	Bozeman
Taylor, Archie G.	Federal Board	Larb
Thompson, Helen	Summer Session	Sheridan
Trackwell, Rosemary	Home Economics	Bozeman
Tretsven, Oscar	Summer Session	Bozeman
Undem, Louis, Jr.	Summer Session	Chicago, Ill.
Vestal, Mrs. May Baxter	Summer Session	Ingomar
Vogt, Marie Viola	Summer Session	Wibaux
Wadsworth, George B.	Federal Board	Bozeman
Walker, Rebecca	Summer Session	Dixon
Wellman, Charles Leon	Summer Session	Olympia, Wash.
Werre, Harold M.	Summer Session	Bozeman
West, Glen E.	Summer Session	Warsaw, N. Y.
Winslow, Lauson	Federal Board	Lewistown
Winter, William M.	Federal Board	Bozeman

Young, George C.	Federal Board	Bozeman
Zacher, Vernon B.	Federal Board	Bozeman
Zimdar, Elaska J.	Federal Board	Bozeman

FARMERS' WEEK

Aakjer, Nic	Bozeman
Alderson, Charles R.	Manhattan
Alderson, Frank	Bozeman
Alexander, Mrs. W. G.	Bozeman
Alsop, Richard	Waterloo
Anderson, A. D.	Harlowton
Anderson, Carrie L.	Knowlton
Anderson, Harry	Knowlton
Arnet, Charles A.	Clyde Park
Asbury, Mrs. C. H.	Bozeman
Atkinson, Mrs. Alfred	Bozeman
Axtell, Mrs. C. E.	Salesville
Baab, Henry	Willow Creek
Ballantyne, Verne	Salesville
Belzer, Frank L.	Glasgow
Birrer, Frank P.	Blaine
Bissonett, Howard P.	Jens
Black, Harry C.	Salesville
Black, T. T.	Whitehall
Boddy, George F.	Big Timber
Bodley, Mrs. R. E.	Bozeman
Border, J. E.	Hedgesville
Border, James F.	Salesville
Border, Raymond	Salesville
Border, Sam	Bozeman
Boyles, Fred M.	Bozeman
Brallow, I. W.	Bozeman
Brandt, Mrs. George	Bridger
Brost, Mrs. P. W.	Nashua
Buell, Mrs. H. S.	Bozeman
Bunnell, L. L.	Bozeman
Carnes, Mrs. Annie N.	Lewistown
Casey, Herman	Bozeman
Christie, Donald	Bozeman
Cleveland, F. C.	Willow Creek
Cobleigh, Esther Cooley	Bozeman
Conkling, Mrs. Leon D.	Bozeman
Conser, C. C.	Plevna
Constant, Mrs. Kate	Bozeman

Constant, Luther M.	Bozeman
Cook, E. R.	Twin Bridges
Cooper, Frank O.	Willow Creek
Cresop, Dwight R.	Lewistown
Crittenden, F. L.	Bozeman
Damerill, Edward H.	Bozeman
Davis, Chester C.	Helena
Davis, Mrs. Floyd	Bozeman
Davis, R. E.	Willow Creek
Delaney, Mrs. J. H.	Bozeman
Dunn, Mrs. R. J.	Anaconda
Ecton, Zales N.	Manhattan
Elliott, Mrs. Harold W.	Salesville
Ferrell, Joseph	Harrison
Ferrell, Mrs. Joseph	Bozeman
Finch, George P.	Bozeman
Fransham, Lorena A.	Bozeman
Froebe, F. J.	Helena
Gaffney, P. H.	Bozeman
Gastineau, Joseph A.	Willow Creek
Gilbert, Mrs. D. S.	Clyde Park
Gilbert, Mrs. H. A.	Perma
Goldberg, Clarence F.	Hall
Green, Mrs. J. A.	Bozeman
Grey, Bendell C.	Bozeman
Grim, C. N.	Clyde Park
Hantridge, T. H.	Drummond
Hand, Ivan	Salesville
Hardy, Mrs. L. A.	Sidney
Harlan, W. B.	Como
Harlen, George	Grey Cliff
Harmon, W. E.	Bozeman
Harrington, Mrs. L. R.	Harlowton
Hauseman, Mrs. D. M.	Bozeman
Hawkins, W. W.	Dillon
Haynes, T. B.	Creston
Helwick, F. J.	Belgrade
Hembre, J. O.	Baker
Hembre, Mrs. J. O.	Baker
Herrett, F. E.	Bozeman
Herron, Clarence	Bozeman
Hoff, A. E.	Bozeman
Holgate, Dr. R. C.	Wilsall
Holker, T. B.	Toston
Howell, Mrs. Herbert	Bozeman

Hyde, L. S.	Salesville
Indreland, Elmer	Lebo
Irvine, William L.	Pipestone Springs
Jackson, Joel C.	Harrison
Jenkins, Ira J.	Bozeman
Knadler, Arthur P.	Belgrade
Knadler, Estelle G.	Belgrade
Knadler, Flora D.	Belgrade
Koch, Mrs. William	Bozeman
Korslund, Mrs. C.	Bozeman
Kremer, Frank	Bozeman
Kremer, John H.	Bozeman
Ladwig, George J.	Intake
Lawrence, Mrs. Frank	Forsyth
Lewis, G. M.	Manhattan
Lillard, J. Wales	Bozeman
Lillard, Mrs. J. Wales	Bozeman
Linfield, Mrs. F. B.	Bozeman
Lingquist, Mrs. F. W.	Helena
Locke, Henry L.	East Helena
Love, Henry	Culbertson
Lovelace, Mrs. W. H.	Bozeman
MacSpadden, F. E.	Great Falls
Madson, George A.	Absarokee
Manry, Bert, Jr.	Bozeman
Marvin, Mrs. Guy	Bozeman
Matter, May E.	Three Forks
Matthews, Mrs. Nora	Twin Bridges
McGlothler, Harry	Bozeman
McKay, Mrs. F. W.	Bozeman
McLees, J. W.	Bozeman
Mecklenburg, Walter S.	Belfry
Mendenhall, D. W.	Glendive
Merrifield, Mrs. T. B.	Rapelje
Mikkelson, Chris	Bozeman
Miller, Mrs. Earl	Stevensville
Miller, Mrs. H. A.	Clyde Park
Mills, Edward F.	Woodside
Morgan, George W.	Havre
Morris, Mrs. Ernest	Bozeman
Murphy, Robert	Bozeman
Nash, Lewis	Bozeman
Ness, John T.	Rosebud
Newport, W. L.	Great Falls
Norris, Benton	Bozeman

O'Connell, Emmett	Salesville
Oma, Mrs. Ole	Bozeman
Oma, Ole	Bozeman
Otto, A. M. G.	Three Forks
Paddick, J. C.	Bozeman
Parkin, Mrs. E. J.	Bozeman
Payne, J. M. L.	Clyde Park
Pearson, Eber J.	Bozeman
Pearson, Mrs. E. J.	Bozeman
Peets, Mrs. J. M.	Bozeman
Penwell, Florence	Belgrade
Penwell, F. P.	Belgrade
Penwell, Mrs. M. W.	Belgrade
Penwell, Merritt W.	Belgrade
Peterson, Carl H.	Lewistown
Peterson, Johannes	Crane
Pound, Robert T.	Lavina
Powell, D. T.	Bozeman
Rice, Mrs. James E.	Harlowton
Rice, Oscar M.	Wilsall
Robinson, Ralph	Stevensville
Roone, Dirk	Manhattan
Roth, George	Laurel
Rundell, Henry M.	Cardwell
Russell, C. R.	Bozeman
Russell, Mrs. C. R.	Bozeman
Rydee, Francis P.	Bozeman
Sartain, Charles A.	Have
Schurch, Walter	Deer Lodge
Scallard, B. A.	Bozeman
Sharp, George W.	Three Forks
Shreve, Ben F.	Hardin
Siegrist, Inez M.	Brockway
Sime, C. E.	Bozeman
Smith, Spencer J.	Bozeman
Spain, Roy L.	Roundup
Spain, Mrs. R. L.	Roundup
Stafford, H. L.	Choteau
Staffanson, Jennie H.	Bozeman
Staffanson, W. V.	Bozeman
Stebbins, Mrs. Roy	Billings
Steeves, M. D.	Livingston
Stewart, David	Crane
Stockton, W. L.	Clarkston
Storm, Mrs. C. M.	Power

Stucky, Mrs. J. J.	Salesville
Stucky, Ralph	Salesville
Sumner, F. C.	Clyde Park
Sumner, Mrs. M. A.	Clyde Park
Sutherland, Emma	Polson
Sutu, John M.	Malta
Theobald, K. Lyle	Bozeman
Thompson, Lester H.	Bozeman
Todd, Layton	Salesville
Towne, Mrs. N. L.	Bozeman
Trenne, M. P.	Poplar
Trentman, L. H.	Kalispell
Tribble, G. D.	Belgrade
Tubbs, Everett L.	Winnett
Van Hoorn, George	Bozeman
Vaux, Augustus	Sidney
Walton, Ben M.	Bozeman
Walton, Mrs. J. W.	Belgrade
Walsh, Mrs. L. C.	Bozeman
Ward, Oliver L.	Salesville
Weaver, Arthur D.	Belgrade
Westlake, A. E.	Bozeman
White, Larry B.	Bozeman
Wicker, Elvin	Bozeman
Wicker, Mrs. W. E.	Bozeman
Wilderman, Mrs. C. M.	Bozeman
Williams, Mrs. Elmer	Bozeman
Wilson, John A.	Stanford
Wyatt, Mrs. L.	Bozeman
Wylie, John M.	Bozeman

Summary of Registration

	1920-21			1921-22		
	Men	Women	Total	Men	Women	Total
College of Agriculture	135	0	135	154	3	157
College of Engineering	214	1	215	272	7	279
College of Applied Science.....	26	38	64	28	31	59
College of Household and Industrial Arts	31	162	193	28	194	222
School of Home Economics.....	0	8	8	0	0	0
School of Mechanic Arts.....	43	0	43	0	0	0
School of Agriculture.....	126	0	126	172	1	173
School of Music	4	68	72	25	102	127
Total	579	277	856	679	338	1017
Summer Quarter	84	56	140	120	65	185
Farmers' Week	72	30	102	135	69	204
Total	785	363	1098	934	472	1406
Counted Twice	62	55	117	109	94	203
Grand Total	673	308	981	825	378	1203

SUMMARY OF REGISTRATION BY COUNTIES

Beaverhead County	11
Big Horn County	5
Blaine County	11
Broadwater County	7
Carbon County	20
Carter County	8
Cascade County	41
Chouteau County	7
Custer County	13
Daniels County	2
Dawson County	9
Deer Lodge County	18
Fallon County	3
Fergus County	30
Flathead County	23
Gallatin County	437
Garfield County	2
Glacier County	1
Golden Valley County	3
Granite County	3
Hill County	10
Jefferson County	15
Judith Basin County	10
Lewis and Clark County	39
Liberty County	5
Lincoln County	17
McCone County	8
Madison County	15
Meagher County	8
Missoula County	18
Musselshell County	7
Park County	35
Phillips County	5
Pondera County	4
Powder River County	2
Powell County	8
Prairie County	2

Ravalli County	26
Richland County	10
Roosevelt County	13
Rosebud County	12
Sanders County	8
Sheridan County	1
Silver Bow County	26
Stillwater County	4
Sweet Grass County	12
Teton County	10
Toole County	1
Treasure County	3
Valley County	14
Wheatland County	8
Wibaux County	6
Yellowstone County	43
<hr/>	
Total Montana	1059
Other States	144
<hr/>	
Grand Total	1203

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